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BUREAU OF HYGIENE AND TROPICAL DISEASES.

TROPICAL DISEASES BULLETIN.

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SUMMARY OF RECENT ABSTRACTS.*

IX. LEPROSY.

Epidemiology.

In *Leprosy in India* (p. 851) a Committee under the chairmanship of LOWE have set out schemes for leprosy surveys in India. These cannot here be given in detail, but all who are contemplating surveys would do well to read the proposals put forward. Control measures, including isolation of patients in homes, colonies, institutions or villages, are also discussed.

LOWE *et al.* (p. 557) have studied the epidemiology of leprosy in a rural area of Western Bengal over a number of years. There has been little change in type of disease, early life is the usual period of onset, and definite evidence of contact is usually found. Neural disease only very rarely becomes lepromatous, but the majority of adult neural cases were found to be tuberculoid in type.

VERGHESE (p. 216) reports that in Orissa the examination of 822,629 persons revealed 5,699 [*i.e.*, 6·9 per 1,000] to be suffering from leprosy in 1939–40.

RAI (p. 217) found an incidence rate of 1·6 per 1,000 in 52,000 people examined in the city of Canton. This is lower than some workers have estimated.

In a detailed field study of leprosy in the Cebu Province of the Philippine Islands, GUINTO and RODRIGUEZ (p. 216) found an incidence of 19·5 per 1,000. The highest incidence of onset was in young persons below the age of 20, and about one-third of the patients gave a history of contact. Most cases are found in overcrowded areas. The same authors (p. 217) report that in another part of Cebu the incidence is only 0·45 per 1,000. The explanation of this difference in the rates in a single province is not apparent, but there is less overcrowding in the lightly infected area.

Leprosy has been widely prevalent in the Maranhão Province of Brazil since 1826, having appeared first on the coast at St. Louis. ROSSAS (p. 218) reports that a recent survey revealed an incidence of

*The information from which this series of summaries has been compiled is given in the abstracts which have appeared in the *Tropical Diseases Bulletin*, 1942, v. 39. References to the abstracts are given under the names of the authors quoted, and the pages on which the abstracts are printed.

1·8 per 1,000. The rates quoted by REVIRIEGO (p. 218) for part of Argentina vary from 0·35 to 2·43 per 1,000.

MUIR (p. 852) gives an account of leprosy in British Guiana, where the disease appears to be decreasing. He points out that this Colony was the first to relax its compulsory segregation laws, at the suggestion of the British Empire Leprosy Relief Association, and that as a result, the early cases can now be treated as out-patients. This has led to larger numbers of patients seeking treatment.

COT LESMES (p. 219) estimates that there are 2,000–4,000 lepers in Cuba, and notes that it is not uncommon to find several cases in one family. Leprosy exists in Porto Rico, but DOULL *et al.* (p. 219) indicate that it is not extensive.

FAGET (p. 852) gives an account of the Federal leprosy institution at Carville, Louisiana. AYCOCK and HAWKINS (p. 219) note that at the Carville settlement there were in 1941 almost 500 American-born patients, most of whom gave a history of contact and came from known leprosy areas in the southern States. In Texas there is a concentration of cases of German stock.

Aetiology. Pathology.

HANKS (p. 220) has conducted an extensive experiment in an attempt to cultivate the leprosy bacillus in a variety of fluid media, either aerobically or under partial pressures of CO_2. For a description of the media and techniques the original should be consulted. All the attempts failed.

CHAUSSINAND (p. 221) has produced nodules in monkeys by inoculation of human leprous material. These nodules eventually disappeared, but it seems that *Macacus cynomolgus* is not entirely refractory to human leprosy. DE SOUZA-ARAUJO (p. 221) has produced granulomata in skin and muscles of rats and mice injected with acid-fast bacilli isolated from skin lesions of human leprosy. The same author (p. 853) has found acid-fast bacilli in the glands of white rats inoculated with gland juice and gland pus of a leper. The rats were kept many months before being killed. From one of the rats cultures were attempted on Loewenstein's medium and there was grown, in pure culture, an acid-fast bacillus which was not *Myco. tuberculosis*; growth was evident after two weeks. The tissues of one rat showed generalized infection, with lepromatous lesions. The author suggests that this work should be continued on a larger scale. FITE (p. 221) also has produced nodules in rats by inoculating human leprous material, especially if suspended in mucin.

DUBOIS and GAVRILOF (p. 621) have failed to infect hamsters with material from human leprosy nodules. MARCHOUX *et al.* (p. 854) have also failed to infect hamsters with human leprosy material; 40 animals were used and different methods of inoculation attempted.

FITE (p. 223) has made a study of the vascular lesions of leprosy. The bacilli may be found in the endothelium of large vessels and in the smooth muscle of small arteries. Infection appears to spread along the vasa vasorum, but foci also originate in perivascular lymph spaces around vessels, and also around nerves, though they were not demonstrated in the lymphatic vessels themselves.

Clinical Findings. Tests.

ARNOLD (p. 224) details the principal diagnostic criteria of leprosy: thermal anaesthesia, muscular weakness or paralysis, thickened

nerves, positive skin or nose smears, histological changes. Skin lesions may be of almost any form, or may be absent. The most important sign is thermal anaesthesia, which is almost invariably present. DAVEY (p. 695) notes how easy it may be to overlook infective leprosy if the well-known signs, such as thickening of the ears, face and skin of the body, are absent. He mentions a case in which the only evident signs were ill-defined areas of pale skin, coalescing with each other, yet numerous bacilli were present in skin of the body, nose and the ears.

HENDERSON *et al.* (p. 767) have found that impression smears of leprotic tissue, stained with auramine O and examined by fluorescence microscopy, show globi and leprosy bacilli more clearly than when the Ziehl-Neelsen method is used.

The lepromin test.—LOWE and DHARMENDRA (p. 227) have confirmed the finding of Fernandez that in cases in which the typical late reaction is given to the injection of lepromin, an early but less intense reaction is provoked. This early reaction, characterized by erythema and oedema, may be hastened by breaking down the bacillary bodies of the lepromin by grinding. The authors do not think that two separate antigens are responsible for the early and late reactions respectively, but that the late result is due to the gradual breaking up of the leprosy bacilli at the site of injection, and the early result to bacilli already broken up in the process of preparing the lepromin.

DHARMENDRA (p. 228) has studied the active principle of lepromin. This is present solely in the bacilli, and not in the tissues of a nodule; it can be obtained in soluble form by breaking up the bacilli separated from the tissues. The author fractionated the dried bacillary powder; he concludes that no isolated fraction gives a late reaction, and that only the protein fraction gives a definite early reaction. This early reaction with a pure antigen is present in most cases in which the late reaction occurs; it is easy to perform and to read, and is as sensitive as the ordinary lepromin test, without the disadvantages of a long wait and undesirable late reactions. He (p. 855) has found that leprosy bacilli provide the active material for the lepromin test, that only the protein fraction of these bacilli is definitely antigenic and that it produces only an early reaction. There are three protein fractions—acid-soluble, nucleoprotein and alcohol-soluble protein; all are active.

DHARMENDRA and LOWE (p. 856) show that three clinical types of reaction can be caused: the classical Mitsuda reaction (nodular), the early erythema followed by the classical reaction, and the early erythema alone. They believe that the bacillary protein is the cause of all these reactions, giving the early result if freely available, and the late result if not free except as a result of breaking down of the bacilli in the tissues.

The late reaction is not produced when any of the isolated fractions, or the residues of the bacilli, are injected. Tests with isolated antigens give results equal to the classical test, and have advantages of speed and avoidance of ulceration, and the authors consider that tests with these antigens should replace those with ordinary lepromin. These observations bring the lepromin test more into line with the allergic skin tests.

The same authors (p. 857) discuss the antigens used by other workers for the lepromin test.

DHARMENDRA and LOWE (p. 696) followed the lepromin test by weekly readings for six weeks in 660 cases of leprosy. No definitely

positive result was obtained in lepromatous cases; 43 per cent. of neural simple, 73 per cent. of neural anaesthetic, and 75 per cent. of neural tuberculoid cases were positive. Besides these a number were classed as weakly positive in all groups. The presence of leprosy bacilli in the lesions is associated with a high incidence of negative reactions; the bacteriologically negative cases give more positive results to the test. The reaction is therefore of value in prognosis.

DHARMENDRA and JAIKARIA (p. 226) have used lepromin for testing healthy persons in an area of high leprosy endemicity in Bengal, and in part of the Punjab in which leprosy was rare or absent. Positive results in Bengal were found in 59 per cent. (100 per cent. in the higher age groups) but in only 36 per cent. in the Punjab. Tuberculin tests were also carried out and the proportion of positive results was found to increase with age. In view of the fact that positive lepromin tests have been found in persons in whom the chances of exposure to leprosy infection are very remote, the authors conclude that the reaction may be, in part, a test of non-specific allergy; but since exposure to infection does undoubtedly increase the proportion of positive results, the test appears to be influenced by allergy. They state that the classical test does not differentiate these two elements.

DHARMENDRA (p. 227) has developed a technique for removing the leprosy bacilli from tissues, and of standardizing them to form a lepromin. This has given good results when used for the lepromin test. A different technique, with a similar object, is described by FERNANDEZ and OLMOS CASTRO (p. 227). In their tests a direct relation between the concentration of the bacillary lepromin injected, and the intensity of the skin reaction, was noted.

HENDERSON (p. 766) describes a method for separating intact leprosy bacilli from leprous tissue by shaking an emulsion of homogenized tissue, in which most of the tissue cells were disrupted but the bacilli intact, with olive oil, and centrifuging. The bacilli were found in the layer between the oil and the water.

Other tests.—DHARMENDRA (p. 220) has investigated the complement-fixing power of leprous sera after absorption with various acid-fast organisms including leprosy bacilli from a nodule. The experiments afforded no proof of the specificity of any of the bacilli, and such tests are not likely to be useful in furnishing evidence for or against the genuineness of cultures of acid-fast bacteria.

GREVAL *et al.* (p. 225) describe their method of preparing the Witebsky, Klingenstein and Kuhn antigen for the complement fixation test in leprosy. GREVAL *et al.* (p. 461) report on their W.K.K. antigen in leprosy and kala azar. They claim that positive results to this complement fixation test are clear-cut and are obtained in early nodular leprosy and in early kala azar before the formalin test is positive. This claim is disputed by LOWE (p. 461), who considers the test to be of little use in diagnosis, prognosis or epidemiological studies.

FONTE (p. 224) reports much the same proportion of positive results to the Wassermann reaction in a group of lepers and a group of apparently non-syphilitic controls in Hawaii; he concludes that the test is of little value in differentiating leprosy from syphilis. PATRICK and WOLFE (p. 226) have found that false positive results may be given in leprosy with Gaehtgen's phenolized cultures of *Spirochaeta pallida* as antigen, but not to the same extent as with the Wassermann and Kahn tests.

Rudolf (p. 228) discusses the Rubino reaction [the sedimentation and agglutination of washed, formolized sheep red cells in dilutions of the serum of the patient]. He concludes that the test is specific in the diagnosis of leprosy in that positive results are extremely rare in other diseases. It is especially positive in the more acute forms of the disease [but the highest rate of positive results quoted was no more than 71·7 per cent.]. Its value in the diagnosis of doubtful, suspected cases of leprosy is still, however, problematical.

Pesce (p. 623) has found the histamine skin test (which he describes) positive in all anaesthetic or maculo-anaesthetic areas of lepers but negative in areas of healthy skin, and in controls. This test is regarded as useful in differentiating leprous maculae or hypochromic areas from those of vitiligo, pinta and the like.

Moiser (p. 696) writes of Muir's potassium iodide provocation test in leprosy; it should be used only in patients in good condition, and, in spite of some unreliability, is still considered to be of value as a guide in deciding on the discharge of patients.

Albarracin (p. 558) describes a case of apparently spontaneous cure in neural leprosy, and remarks that in one area of Colombia the disease is probably undergoing change, as though the subjects were acquiring some immunity against it.

Treatment.

Cole and Cardoso (p. 229) have estimated the percentage composition of the various fatty acids in the chaulmoogra oils from *Hydnocarpus wightiana; H. anthelmintica* and *Taraktogenos kurzii*. They discuss the value of these oils in view of their different content of gorlic and hydnocarpic acids [Rogers found the latter to be the most effective fraction of the oils].

Chaussinand and Guillerm (p. 230) write favourably of the action of the sodium soap of *H. anthelmintica* oil, given orally, and continued if necessary for years, to patients in the early stages of disease. For those needing more active treatment the ethyl esters are preferred, for injection by several routes, but preferably into muscle. By these means remarkable results have been achieved at little cost. They note that segregation laws, even if they are not rigorously enforced, tend to cause the concealment of disease; these should be suspended except for those who refuse dispensary treatment and who are dangerous to the community.

Collier's diphtheria toxoid treatment is reported on by several workers. The general opinion appears to be that the favourable results recorded from Thailand have not been confirmed in other countries. McKean (p. 231) has given this treatment in Thailand. He admits the limitations of the method but states that the best results are obtained in tuberculoid cases with few bacilli, and in early neural cases. These are the types of disease in which chaulmoogra treatment is most useful. Early lepromatous cases showed good results at first, but there were some relapses. The treatment was of no value in major tuberculoid disease with numerous bacilli, in papular lepromatous disease or in active minor tuberculoid disease. Collier (p. 231) reports four cases in which the administration of diphtheria toxoid was followed by relief of pain in cases of enlarged nerves due to leprosy. He maintains that this treatment has given satisfactory results in over 300 cases.

DAVISON and GRASSET (p. 232), on the other hand, have failed to confirm the findings of the Thailand workers on the benefit of the diphtheria toxoid treatment of leprosy, except in a small proportion of neural cases such as would be expected to improve under treatment with chaulmoogra. They discuss the theory advanced by the Thailand investigators that there is a predisposing suprarenal inefficiency in leprosy, and report that they have found no evidence of this, even after a special enquiry. DE SOUZA-ARAUJO (p. 462) has also conducted a trial of the diphtheria toxoid treatment, but without any particularly good results. CHATTERJEE (p. 697) also has failed to find any value in the diphtheria toxoid treatment of leprosy. FAGET and JOHANSEN (p. 698) similarly report failures at the Carville institution.

Among several points noted in the Annual Report of the Madras Provincial Council of the British Empire Leprosy Relief Association (p. 229) are that sulphapyridine may produce severe febrile reactions, without benefit, and is therefore contraindicated in leprosy, and that the diphtheria antitoxin and toxoid method of treatment did not confirm the claims of its originators.

PALDROK (p. 462) writes of the value of treatment of lepromata by the local application of rods of solid carbon dioxide. In his view the cold thus induced destroys the covering envelope of the leprosy bacillus (which he regards as a fungus) and allows the products of decomposition to be absorbed and to provoke the formation of antibodies. If, after treatment in this way for two years or so, the body loses its capacity to respond to CO_2, a new chemotherapeutic stimulus must be used, and for this purpose he advocates solganol. The treatment is reported to achieve considerable success provided that good food and hygiene, adequate exercise and weekly sweat baths are insisted upon. He has used these methods in Estonia.

ALBERTO CASTRO (p. 623) has used injections of acetyl choline and insulin in the treatment of perforating ulcers in leprosy; the former for its vasodilating action and the latter for its power of stimulation and of fixing albuminoid substances in the body. He claims good results. Details of the methods of injection are given.

Control.

DAVEY (p. 850) reports on the very effective control measures which are being undertaken in the Owerri Province of S. Nigeria around the Uzuakoli settlement. In this area infection rates vary from 1·3 to 15·2 per cent. Over 1,000 patients are isolated in the settlement, 2,000 others are isolated (voluntarily) in model leper villages constructed on sites provided free by the local chiefs. These villages have land for cultivation. There are 29 clinics at which over 7,000 cases receive treatment; most of these are in the early stages. In many areas complete control of all cases has been achieved, first by starting clinics for treatment and then, when confidence has been established, by conducting house surveys. There are over 70 trained male nurses in the scheme, together with a number of educated native leprosy workers and a few members of the Toc H organization. The whole work is supervised by two medical officers. The scheme is very economical and could be even more widely extended by the provision of more workers and of moderate funds.

BLOSS (p. 851) writes of the Li Rangu settlement in the Sudan, where there are almost 1,000 in-patients; 1,400 out-patients are

dealt with at dispensaries in the Yambio sub-district. The incidence of leprosy in this area is about 4 per cent.

BÜNGELER (p. 622) has observed for 13 years 300 children of leprous parents, who were separated from their parents at a very early age; in none did leprosy develop. He also made histological examinations of the organs of 60 infants of leprotic mothers without finding any evidence of congenital infection. The early separation of infants from infected mothers is therefore an effective preventive measure.

Charles Wilcocks.

MALARIA.

CAUSEY, O. R., PENIDO, H. M. & DEANE, L. M. **Observations on Malaria in the Presence and Absence of *Anopheles gambiae* in an Experimental Area (Cumbe) Ceará, Brazil.** *Amer. J. Trop. Med.* 1943, Jan., v. 23, No. 1, 59–71.

During the execution of the programme for the eradication of *A. gambiae* in Brazil, the district of Cumbe was set aside for experimental studies. Cumbe, an isolated locality in the lower Jaguaribe Valley, has a population of about 300 living in an area of 1·6 square kilometres. Prior to 1938 Cumbe was almost free of malaria; then *A. gambiae* came. In September 1939 the parasite index was 39·6 per cent., in spite of the facts that 965 doses of drugs had been administered to the population during the preceding six weeks, and that during the previous seven months Paris green had been applied to some of the water collections. In September the use of Paris green was suspended and medication was reduced. In January 1940, regular studies on mosquitoes and malaria were begun. Mosquitoes were unmolested except for the hand collection of adults during a ten-minute search of every room about six times a month and the routine collection of a few larvae. The entire population was interviewed monthly, and changes in parasite and spleen rates were recorded. The extermination of *A. gambiae* was begun in May. During the first four months *A. gambiae* density, parasite rates and spleen rates rose together. Eradication measures were followed by a fall in the parasite rate from 85·7 per cent. in April to 20 in June, and by a more gradual reduction in the spleen rate from 64·4 per cent. in April to 10 in September. There were but small differences in the parasite rates of the different age groups, a fact which confirms the report that the area had previously been free of endemic malaria. Spleen rates were higher among children than among adults. In January *P. vivax* was most in evidence. With rising *A. gambiae* density *P. falciparum* infections increased rapidly, while *P. vivax* infections decreased slowly. The ratio of gametocyte carriers to cases of malaria remained fairly constant throughout the period of observation. *Norman White.*

HUFF, C. G., COULSTON, F. & CANTRELL, W. **Malarial Cryptozoites.** *Science.* 1943, Mar. 26, 286.

The authors point out that in discussions regarding the development of malarial sporozoites after their entry into the body of the vertebrate host, difficulties arise owing to the lack of a satisfactory name for the

early stages. They accordingly introduce the term cryptozoite for the first generation of malarial parasite developing from a sporozoite. This stage is exoerythrocytic and may be a uninucleate form, a multinucleate form or a schizont. It is possible that in some malarial parasites the sporozoites will be found to enter directly into the red blood corpuscle, as SCHAUDINN claimed for *Plasmodium vivax*, in which case there would be no cryptozoites in the cycle of such a species. The cryptozoite thus covers all stages of development following the entry of the sporozoite into a cell other than an erythrocyte up to the mature schizont which is ready to produce the merozoites of the next generation.

C. M. Wenyon.

IRDEM, E. Anoph. Sergenti en Turquie. [*A. sergenti* **in Turkey.**] *Rev. d'Hygiène.* Ankara. 1942, Aug., v. 17, No. 104. [In Turkish 296–7. French summary (7 lines) 297.]

A. sergenti is reported in Turkey, for the first time. Larvae were found in 1940 along with larvae of *A. superpictus* and other mosquitoes in hoof marks at Antakya. *C. W.*

HADDOW, A. J. **Measurements of Temperature and Light in Artificial Pools with Reference to the Larval Habitat of** *Anopheles* (*Myzomyia*) *gambiae*, **Giles, and** *A.* (*M.*) *funestus*, **Giles.** *Bull. Entom. Res.* 1943, June, v. 34, Pt. 2, 89–93, 2 figs.

Anopheles gambiae breeds in water fully exposed to sunlight; *A. funestus*, *A. coustani* and *A. pharoensis* usually in water shaded by standing herbage. In order to compare the conditions of illumination and temperature in these two types of breeding place the author used pans 1 foot in diameter and eight inches deep, half filled with earth and sunk flush with the ground. One contained clear water, one muddy water, one clear water with growing grass 1 ft. high and one, without vegetation, was completely shaded by two thicknesses of papyrus matting 1 ft. above the surface. The maximum light intensity in the grassy pool was less than half that in the open pool. With regard to temperature, there was no difference between the clear and the muddy water, but the growing vegetation showed an insulating power equal to that of the papyrus matting. The daily range of temperature in the grassy pool (7·0°C.) was less than in the Stevenson screen (9·0°C.) and far less than in the open pool (15·5°C.). The grassy pool was cooler by day and warmer by night than the open pool (afternoon maximum: grassy pool, 27°C.; open pool, 34·5°C. After midnight minimum: grassy pool, 20°C.; open pool 19°C.). [These are the readings in one experiment; a second gave similar results.] Thus not only do the breeding places of *A. gambiae* reach much higher temperatures than those of such species as *A. funestus*, but they also undergo much greater temperature fluctuations. *V. B. Wigglesworth.*

LEVER, R. J. A. W. **The Malarial Mosquito of Melanesia.** *Agric. J. Fiji.* Suva. 1942, v. 13, No. 4, 116–17. [14 refs.] [Summary taken from *Rev. Applied Entom.* Ser. B. 1943, July, v. 31, Pt. 7, 131.]

Notes are given on the breeding places of *Anopheles punctulatus*, Dön., the vector of malaria in Melanesia, which is found in the Solomon

Islands and New Hebrides, but is not known to be present in Fiji. Within its area of distribution, Belep alone is free of it, while malaria occurs in Aneityum, just south of 20° S. lat. The Anopheline and malaria first appeared in Rennell between 1933 and 1937. As its larvae have been taken in widely differing kinds of water and even in hot springs, it could easily find suitable breeding places in Fiji, and the utmost vigilance to prevent its becoming established is necessary, particularly in view of the fact that the chief form of malaria in the Solomon Islands is malignant tertian [*Plasmodium falciparum*].

Eyles, D. E. & Bishop, L. K. **An Experiment on the Range of Dispersion of** *Anopheles quadrimaculatus*. *Amer. J. Hyg.* 1943, May, v. 37, No. 3, 239–45, 1 fig.

In an experiment in the neighbourhood of Reelfoot Lake, Tennessee, the authors collected some 16,500 *Anopheles quadrimaculatus*, dusted them with fine aluminium powder, released them at a given point and then examined all mosquitoes captured during the ensuing twelve days at a series of stations extending up to 2·75 miles from the point of release. Thirty-one females were recovered at a distance of 2·0 to 2·5 miles; one male was recovered at a distance of 2·0 miles. The mosquitoes were collected in lamp chimneys with the narrow end open and the wide end covered with bobinet and connected to a small electric vacuum cleaner. They were dusted by closing both ends of the lamp chimney with cardboard disks, blowing in the fine metallic dust and shaking the mosquitoes gently for a few minutes.

V. B. Wigglesworth.

Bang, F. B., Quinby, G. E. & Simpson, T. W. **Studies on** *Anopheles walkeri* **Theobald conducted at Reelfoot Lake, Tennessee, 1935–1941.** *Amer. J. Trop. Med.* 1943, Mar., v. 23, No. 2, 247–73, 18 figs. & 1 pl. [20 refs.]

Anopheles walkeri occurs in most of the eastern United States but is usually rather uncommon. At the Reelfoot Lake, Tennessee, however, it is abundant, forming 38·5 per cent. of the adult anophelines collected in light traps during the investigations here described. It breeds in water with dense emergent vegetation. It could be taken in light-traps at distances of 1½ and 2 miles from the nearest breeding places. The adults rest by day in dark humid places; sometimes near the moist floor of barns, but most commonly upon the dark shaded bases of vegetation growing in water or wet mud. Experiments on the entry of adult females into houses showed that the presence of artificial light was the attractive factor. The presence or absence of human beings seemed to have no influence on the numbers entering. The introduction of electric light in rural areas may thus favour the entry of this mosquito into houses and may cause it to become a malaria carrier of some importance. In the present survey a single specimen out of 2,003 was found infected with an unidentified species of Plasmodium. *A. walkeri* usually occurs alongside *A. quadrimaculatus*, which is a more hardy species and probably far more important as a vector of malaria. These two species are very similar. The authors describe several new distinguishing characters, the most useful being the halteres which are entirely light-scaled in *A. walkeri*, and have light stems with black knobs in *A. quadrimaculatus*. *V. B. Wigglesworth.*

KOMP, W. H. W. *Anopheles clarki*, **a New Species of Nyssorhynchus of Wide Distribution in South America. (Diptera : Culicidae).** Reprinted from *Proc. Entom. Soc. Washington.* 1942, Dec., v. 44, No. 9, 196–201, 4 figs.

It is now generally recognized that the American subgenus *Nyssorhynchus* of *Anopheles* contains a number of very similar species, several of which have been confused with *tarsimaculatus*. The species here described can only be recognized with confidence by examination of the male genitalia. It is probably quite widely distributed, for material has already been seen from several places in N. W. Argentine and N. E. Brazil. The existence of this undetected species invalidates much that has been published on the variability of *Nyssorhynchus*, and on the biology and relation to malaria of these insects. The importance of critical systematics is emphasized. *P. A. Buxton.*

BOYD, M. F. & KITCHEN, S. F. **On Attempts to hyperimmunize Convalescents from Vivax Malaria.** *Amer. J. Trop. Med.* 1943, Mar., v. 23, No. 2, 209–25, 9 figs.

Recovery from an attack of *vivax* malaria results in the acquisition of a very potent immunity to the strain of parasite which caused the attack. Reinoculation of such a convalescent with trophozoites of the homologous strain is likely to cause a subclinical parasitaemia. Experiments were carried out to determine whether a series of such reinoculations would confer on the patient the ability to remove promptly large numbers of trophozoites without the development of this subclinical parasitaemia. The McCoy strain of *P. vivax* was used throughout. The very interesting experiments are recorded in detail. It was found that it was not desirable to commence the reinoculations as long as the primary parasitaemia remained at microscopic levels, and that the reinoculations should be spaced at intervals longer than the likely prepatent period. The early reinoculations were sometimes followed by the return of a subclinical parasitaemia, probably a superinfection. Later inoculations may not be followed by any parasitaemia ; when this point is reached the patient may be considered as hyperimmune. Such a hyperimmune subject can withstand a dose of parasites many million times greater than the minimum infecting dose without any clinical reaction or parasitaemia. It would appear that this hyperimmunity is not ascribable to circulating antibodies ; 500 cc. of the blood of hyperimmunized patients transfused into other patients were incapable of preventing the infection of susceptible persons or of modifying the course of a developed infection any more than would a similar quantity of normal human blood.

Norman White.

HILL, R. B., CAMBOURNAC, J. C. & SIMÕES, M. P. **Observations on the Course of Malaria in Children in an Endemic Region.** *Amer. J. Trop. Med.* 1943, Mar., v. 23, No. 2, 147–62.

Twenty-two children in the village of Aguas de Moura, Portugal, were examined each week during 1937 and 1938, and seen irregularly for three years before and one year after these two years. Aguas de Moura has a stable population of about 450. A malaria station was opened there in 1934. At that time malaria endemicity was relatively low ; no rice was being grown within two kilometres of the village. In November of that year the spleen rate was 42 and the parasite rate 33 in children up to 12 years of age. In 1935 rice was planted within half a

kilometre of the village and the incidence of malaria increased; the spleen rate increased to 70 per cent. and remained about that level in succeeding years. The parasite rate varied between 20 and 40 per cent. Rice fields in this part of Portugal are enormously productive of *A. maculipennis atroparvus*, the vector. The species of parasite found in patients coming for treatment to the dispensary in 1935 were: *P. vivax* 103, *P. malariae* 33 and *P. falciparum* 222. In subsequent years dispensary attendances for malaria became progressively fewer in spite of the fact that rice culture extended still closer to the village; it is probable that the decreased attendance was not caused by a decreased number of infections. Cases of malaria treated in 1939 were 144, *P. vivax* 82, *P. malariae* 5 and *P. falciparum* 57.

The observations on the 22 children are recorded in detail. They show that children are infected early in life and reinfected at intervals. The gradual development of immunity enables them to tolerate later infections. The rate of development of immunity and the degree of immunity developed are both subject to individual variations. Up to about eight years of age children may harbour parasites for long periods. At later ages they tolerate reinfections with little discomfort. In both relapses and reinfections the spleen enlarges but the parasite count is never so high as in primary infections; the parasite count is higher in reinfections than in relapses. Reinfection in parasite-free individuals is followed by a more severe attack than in carriers. Both *P. vivax* and *P. falciparum* may appear in the blood at any season; infections may occur in early spring. Experimental infection of three children produced results similar to those observed in other children of the group who were considered to have had natural reinfections.

Norman White.

Rice, Margaret E. & Watson, R. B. **The Relationship between Malaria Morbidity and Parasitemia.** *Amer. J. Hyg.* 1943, Mar., v. 37, No. 2, 164–72, 1 fig.

The authors have previously reported the results of inquiries carried out in three populations in the Tennessee Valley to determine the amount of protection afforded by the mosquito-proofing of houses against malaria infection [this *Bulletin*, 1942, v. 39, 261, 436]. Blood film surveys were carried out in April, August and October of 1939 and 1940. Malaria morbidity reports were also made, based on weekly inquiries made at each house by either a public health nurse or a physician. There was little correlation, if any, between reported morbidity and subsequent blood-film findings. For the white population there was a relation between the percentage of persons harbouring parasites and the percentage of persons with negative blood films who stated that they had suffered from malaria in the interval since the previous blood film survey. A catalytic curve shows the trend of this correlation. For the Negro population there appeared to be no relationship between morbidity-reporting and the results of the blood surveys.

Norman White.

Brill, N. Q. & Pellicano, V. L. **Estivo-autumnal Malaria with Frontal Lobe Syndrome.** *J. Amer. Med. Ass.* 1943, Apr. 3, v. 121, No. 14, 1150–52.

This is the record of a very unusual case of *P. falciparum* malaria. Symptoms of cerebral involvement were manifest from the beginning

of the attack ; subsequently they dominated the clinical picture. An organic psychosis developed. Aphasia, alexia, agraphia, memory defect and mental confusion were associated with involvement of the pyramidal tracts. The malaria infection responded to atebrin but the symptoms persisted for some time ; it was three months after the onset of the first febrile attack that the patient was finally discharged from hospital. He made a good recovery. *Norman White.*

DE SARAM, G. S. W. & TOWNSEND, R. F. **Spontaneous Rupture of the Spleen in Malignant Tertian Malaria.** *Lancet.* 1943, May 8, 584–5.

This is the record of an unusual case. A man aged 21 was admitted to hospital suffering from an attack of *P. falciparum* malaria. His general condition was good on admission. The spleen was not palpable. On the following afternoon he had a severe attack of vomiting. Soon after he complained of abdominal discomfort, not amounting to pain, and passed several stools. A quarter of an hour later he was collapsed, pulseless, cyanosed and semi-conscious. The abdomen was relaxed. Restlessness and air hunger, suggesting a major haemorrhage, preceded death ; his condition did not warrant any form of operative treatment. Post mortem a subcapsular blood clot extended over the whole surface of the spleen ; there was a tear two inches long in the upper part of the outer side of the capsule, and about two pints of blood were found in the peritoneal cavity. The absence of any history of trauma, the absence of localizing signs of the subcapsular haemorrhage, and the late and sudden onset of signs of extensive abdominal haemorrhage are unusual features of this case. *Norman White.*

DE GROAT, A. **The Kahn Verification Test in Malaria.** *J. Lab. & Clin. Med.* 1943, Apr., v. 28, No. 7, 882–5.

Kahn Standard, Presumptive and Verification tests [*Bull. of Hyg.* 1940, v. 15, 641 ; 1941, v. 16, 241 and 480 ; 1942, v. 17, 440] were applied in Kahn's laboratory to the sera of 18 malarial, clinically non-syphilitic patients. The Standard test gave positive reactions with seven and doubtful reaction with one ; the Presumptive test gave positive reactions with 10 ; and the Verification test gave positive reactions of the general biologic type (positive at 0°C., but negative at 37°C.) with all but four. One of the four gave an inconclusive reaction with the Verification test (positive with the other two tests), and the other three were negative with all three tests.

Serial tests of the sera from the seven patients who had given positive reactions with the Standard Kahn showed that all became negative in from one to three months, this being fair evidence that the reaction was not due to syphilis. During this time the general biologic type of reaction persisted after the reaction to the Standard test had become negative, but in all but one subject the final reaction to the Verification test was negative. The general biologic type of reaction was given by the sera from four patients which had been positive in some degree to the Presumptive test, but eventually all became negative. Two non-malarial, febrile patients gave general biologic reactions ; one was negative to the other two Kahn tests ; and one, with an acute respiratory infection, was at first positive, becoming negative later.

L. W. Harrison.

Brodie, B. B. & Udenfriend, S. **The Estimation of Quinine in Human Plasma with a Note on the Estimation of Quinidine.** *J. Pharm. & Exper. Therap.* 1943, June, v. 78, No. 2, 154–8.

A simple precise method is described for the estimation of quinine in human plasma. One part of plasma is diluted with 39 parts of water ; and 10 parts of 20 per cent. metaphosphoric acid are added with vigorous shaking. After 15 minutes, the mixture is centrifuged. The clear supernatant is placed in a Coleman Photofluorometer and compared with a standard solution of quinine. The method includes fluorescent degradation products of quinine, if such are present, but this error is small and constant, *viz.* 2–15 per cent., average 11 per cent. Concentrations of 1 mgm. per litre and higher can be estimated conveniently. Of the other alkaloids of cinchona bark, only quinidine fluoresces appreciably ; the fluorescence of quinidine is closely similar to that of quinine and the same method may be employed for its estimation.

F. Hawking.

Franks, A. G. & Davis, M. I. J. **Agranulocytosis. Complication following Quinine in a Case of Malaria Therapy.** *Amer. J. Syph.* 1943, May, v. 27, No. 3, 314–18, 1 fig. [12 refs.]

Wingfield, A. **Treatment of Malaria.** [Correspondence.] *Brit. Med. J.* 1943, June 19, 770.

Stephenson, R. W. **Dose of Atebrin in Malaria.** [Correspondence.] *Ibid.*, 770.

Wingfield has used the following treatment for subtertian malaria : Two daily intramuscular injections of quinine (solvochin) for four days, followed by mepacrine 0·1 gm. thrice daily for seven days, and, after a short interval, by pamaquin 0·01 gm. thrice daily for three days. This produces defervescence of the fever within 72 hours, and saves quinine ; the solvochin injections are almost painless.

Stephenson advocates large doses of atebrin [mepacrine], and has given this drug in many hundreds of cases in the following dosage : First dose 0·3 gm., if possible between paroxysms ; second dose 0·3 gm. given six hours after the first ; second and third days, 0·2 gm. morning and evening ; fourth to sixth day (inclusive), 0·1 gm. thrice daily. With this treatment pyrexia is rapidly brought under control, no toxic effects have been encountered, and there is evidence that relapses are less common than with the lower doses usually recommended. The author writes from the Sudan, where Bryant has, independently, reached much the same conclusions [see this *Bulletin*, 1942, v. 39, 666].

C. W.

Murray, J. E. & Shute, P. G. ; Thompson, K. **Drug Control of Malaria.** [Correspondence.] *Lancet.* 1943, July 31, 142.

In this short note the authors insist that mepacrine [atebrin] is at least the equal of quinine in the treatment of subtertian malaria, and that it can be given with confidence. In their view 0·6 gm. mepacrine is the equivalent of 15, or at most 20, grains of quinine. They emphasize the importance of immediate treatment, even if parasites are

scanty in the blood ; it cannot be claimed that because few parasites are seen the infection is mild.

Thompson remarks that while in W. Africa he had *P. falciparum* in his blood at every examination over a period of 15 months, during which time he was taking quinine in doses of 10–30 grains daily. Later he took a course of mepacrine and his blood, positive the first day, became negative and has remained so for eight months. The routine treatment in his hospital is mepacrine 0·6 gm. the first day and 0·3 gm. each subsequent day [but for how long is not stated]. Parasites usually disappear in 24 hours and no signs of toxicity have been seen. In *P. vivax* infections a supplementary course of pamaquin was given. Thompson mentions a clear case of quinine-fast *P. falciparum*. He emphasizes the importance of commencing mepacrine prophylaxis at least immediately on arrival at a malarious country and not, as is often the case, after arrival ; passengers at one port are often infected before disembarkation. Mepacrine tablets should be crushed ; in the tropics uncrushed tablets have been passed in the stools.

He notes the importance of leucocyte counts in diagnosis. In a malarious country, if the blood contains parasites with normal leucocyte count the disease is probably malaria ; leucocytosis is usually an indication of a complication, such as appendicitis, even if parasites are present. *C. W.*

BARBER, J. F. **A Preliminary Report on Malaria in a Combat Zone.** *U.S. Nav. Med. Bull.* 1943, July, v. 41, No. 4, 977–9.

This is a report on the use of atebrin and quinine for the prevention and treatment of malaria in a group of men of the United States Navy during a period of six months' continuous service in a heavily infected malarial region of the tropics.

Prophylaxis.—Atebrin was given by mouth, the dose being half of a 1½ grain tablet [*i.e.* 0·05 gm.] daily on weekdays and a whole tablet [0·1 gm.] on Sundays, making a total of 6 grains [0·4 gm.] weekly. There was no intolerance of the drug.

Treatment of clinical malaria.—The following course of treatment was given : Quinine hydrochloride 45 grains, divided into 3–5 doses, daily for three days ; then 30 grains daily for seven days, but on the sixth day one tablet of atebrin was added and two tablets on the seventh day ; then atebrin alone, 4½ grains [0·3 gm.] daily, was given for five days ; finally quinine, 15 grains daily, was given for two weeks. Following this course the patient returned to prophylactic doses of atebrin. The stay in hospital was not longer than 5–7 days but the man was on light duty until the end of the first quinine course. " Results with smaller doses and less protracted courses of treatment have been discouraging." Measures of mosquito control were also in use.

Results.—There were 86 cases of malaria and 19 relapses. At the end of the six months blood smears from 224 men were examined and malaria parasites were found in 23 ; of these two had a raised temperature and clinical signs of malaria, the others being apparently well. The author concludes that in these conditions, " in spite of thorough control, 9 to 10 per cent. of the men will show positive smears on a single slide survey, but . . . those men will be clinically well and able to hold their places at their guns."

[The author does not state whether these men were white or coloured or whether they had lived previously in malarious regions.]

J. F. Corson.

Dearborn, E. H., Kelsey, F. E., Oldham, F. K. & Geiling, E. M. K. **Studies on Antimalarials. The Accumulation and Excretion of Atabrine.** *J. Pharm. & Exper. Therap.* 1943, June, v. 78, No. 2, 120–26, 1 fig. [17 refs.]

Tablets of mepacrine dihydrochloride [atabrine] were given to dogs by mouth in daily doses of 5 mgm. per kgm. for one group and 50 mgm. per kgm. for another group. This was continued for four weeks. To avoid vomiting, the tablets were coated with cellulose-acetate-phthalate; this formed a satisfactory enteric coating, as no vomiting occurred and about 80 per cent. of the administered drug was absorbed. The mepacrine in the urine, faeces, and tissues was estimated by a method depending on extraction with iso-amyl alcohol at *p*H 8·5, and measurement of the fluorescence. After seven days, the excretion of mepacrine in the urine and faeces reached a constant level; less than 4 per cent. of the daily intake was excreted, indicating that most of the mepacrine is retained and destroyed in the body. Since the concentrations in the tissues do not continue to rise, the dog must destroy mepacrine as quickly as it is absorbed. After 14 daily doses of 50 mgm. per kgm. body weight the concentration of mepacrine (expressed as mgm. per kgm. of tissue) was as follows (average figures):—adrenals 300; bile 250; blood 2; bone marrow 108; brain 8; heart 70; kidney 89; liver 850; lung 160; muscle 21; pancreas 300; skin 35; spleen 250. With doses of 5 mgm. per kgm. body weight, the tissue levels were only about one-tenth of these. No histological damage, due to mepacrine, was detected in the organs.

When sulphadiazine was given at the same time as mepacrine the tissue levels of mepacrine were somewhat lower than they would otherwise have been; when sulphathiazole was given simultaneously, they were considerably lower. The mepacrine had no effect upon the blood levels of either free or total sulphathiazole or sulphadiazine.

F. Hawking.

Hawking, F. **Intramuscular Injection of Mepacrine (Atebrin): Histological Effect.** *Brit. Med. J.* 1943, Aug. 14, 198–9. [16 refs.]

Mepacrine methanesulphonate (atebrin musonate), 50 mgm. in 0·5 cc. of distilled water, was injected into rabbits of from 1·5 to 2 kgm. in weight. Most of the injections were made into the muscles of the thigh or the loin; some were made under the skin of the abdominal wall. Absorption is rapid. Larger doses than the above often produced prostration of the rabbit in 5 minutes and were sometimes fatal. Injections were also made into rats. The rabbits were killed 1 to 5 days after the injection and the rats 1 to 14 days after. The site of the injection was excised, fixed in formol-saline, and examined by the usual histological procedure. The macroscopic lesions were often inconspicuous, but microscopic examination always showed a certain amount of necrosis at the site of injection. This was similar in kind to the necrosis caused by quinine injections but probably less than one-third as extensive. The damage caused by 50 mgm. of

mepacrine was comparable in extent to the damage caused by 20 mg. of quinine, and the standard dose of quinine intramuscularly is greater than the standard dose of mepacrine. *Norman White.*

Folha Medica. 1943, Feb. 25, v. 24, No. 4, 35–6. O iodomercurato de manganês na profilaxia da malaria e na terapeutica das formas crônicas. Sintese das recentes experiencias realizadas no Nordeste. [**Manganese Iodo-Mercurate in the Prophylaxis of Malaria and in the Treatment of Chronic Cases. Synthesis of Recent Experience in the North-East of Brazil.**]

Iodo-mercurate of manganese in combination with extract of spleen has been tried out on a fairly extensive scale in the north-east of Brazil and this paper, summarizing some of the results achieved, speaks in high terms of the value of the remedy as a prophylactic and in the treatment of chronic malaria infections. [It will be recalled that the Biochemical Institute of Milan issued an exactly similar preparation which it called M3. Most of the many reports that have been published do not support the claims that have been made with regard to its value as a prophylactic—this *Bulletin*, 1938, v. 35, 31 ; 1939, v. 36, 262 ; 1940, v. 37, 503 ; 1942, v. 39, 179.] The remedy given in small and increasing doses stimulates the reticulo-endothelial system, eliminates the parasites sheltering in the spleen and other viscera, stimulates haemopoiesis, and causes a reduction of the splenomegaly. The resistance to malaria conferred by treatment only becomes apparent some two months after the completion of treatment. In cases in which this resistance is insufficient to prevent infection the malaria attacks that develop are of an extremely mild type and readily curable. The remedy is of special value in the treatment of chronic cases. Such are the conclusions that emerge from the experience of the industrial and other organizations which are related in this paper ; the unanimity of opinion is remarkable. *Norman White.*

Mevzos, M. P. Mesures antipaludiques dans la construction du grand canal de Ferghana de Staline. [**Anti-Malaria Measures during the Construction of a Large Canal.**] *Med. Parasit. & Parasitic Dis.* Moscow. 1940, v. 9, No. 4, 384–91, 3 graphs. [In Russian.] [Summary taken from *Rev. Applied Entom.* Ser. B. 1943, July, v. 31, Pt. 7, 127.]

In 1939, a large irrigation canal was constructed between June and December in the region of the upper Suir-Dar'ya (eastern Uzbekistan), and the measures that were adopted with considerable success to reduce the spread of malaria among the workmen engaged are reviewed. The canal is 170 miles long and passes through a densely populated area with numerous rice-fields as well as swamps and reservoirs, all of which are infested with Anopheline larvae. Most of the excavation work was carried out in August and September, which is the season when the incidence of malaria reaches its peak in Uzbekistan. The Anophelines that were observed in those months were *Anopheles pulcherrimus*, Theo., and *A. hyrcanus*, Pall., which were in general the commonest, and *A. maculipennis* var. *sacharovi*, Favr., and *A. superpictus*, Grassi, which were the most numerous away from the rice-fields. The measures taken comprised regular medical treatment of

the workmen, the distribution of mosquito nets, the application of larvicides over an area of 60 square miles by aeroplane and over smaller areas by hand, and periodical drainage of rice-fields.

NEWBOLD, C. E. & COCHRANE, E. **Control of *A. argyritarsis* by Flushing.** *Caribbean Med. J.* 1943, v. 5, No. 2, 91–2.

TRAGER, W. **The Influence of Biotin upon Susceptibility to Malaria.** *J. Exper. Med.* 1943, June 1, v. 77, No. 6, 557–82, 11 charts & 4 figs. on 2 pls. [47 refs.]

Individuals are believed to differ in their susceptibility to malaria. The importance of nutritional status has been emphasized in this connexion, but the influence of any particular factor has not been determined. The only definite experimental evidence on the effect of nutritional status is that of PASSMORE and SOMMERVILLE [this *Bulletin*, 1941, v. 38, p. 646] who found that infected monkeys kept on a deficient diet did not develop more severe malaria than control animals kept on an adequate diet.

In the present investigation the influence of different levels of biotin in the blood of ducks and chickens on their susceptibility to *P. lophurae* infection and likewise of ducks to *P. cathemerium* infection has been studied, with, in some cases, a concomitant condition of pantothenic acid deficiency. The influence of administered biotin on the course of malarial infections in ducks was also studied.

The chickens and ducks were rendered biotin-deficient by feeding them on a diet containing a large proportion of dried egg white and the features of the resulting syndrome in these birds are illustrated by photographs. Control birds were given biotin by mouth or parenterally, or alternatively the egg white was replaced by casein ; a description of the various diets is given. When biotin deficiency was apparent the birds were inoculated with numbers of malaria parasites proportional to body weight, care being taken that the blood-volume and r.b.c. counts were approximately the same in experimental and control animals in order to ensure accurate comparison of subsequent parasite counts. Assays of the blood-biotin level were made at the start and during the course of the experiment by a microbiological method.

The investigation showed that biotin-deficient chickens and ducks infected with *P. lophurae* had more severe infections than non-deficient birds, and biotin-deficient ducks also showed increased susceptibility to *P. cathemerium* infection. On the other hand marked pantothenate deficiency was without effect. In birds infected with *P. lophurae* the biotin level of plasma and of red blood cells rose and fell with the numbers of parasites present. While administration of biotin to birds with partial deficiency of this substance lessened the severity of *P. lophurae* infections it failed to influence the infection in non-deficient birds, which possibly excreted the excess biotin more rapidly.

Assays of the blood showed that *P. lophurae* infections in chickens and ducks modified the biotin level for a time, and the author suggests that this substance may be mobilized in the blood from other tissues and show activity by reducing the number of parasites. Moreover, since plasma-biotin in chickens infected with *P. lophurae* rises more rapidly and to a higher level than in ducks we may here have an explanation of the fact that chickens at a certain age get rid of their

infections more quickly. Increases in plasma biotin were not due to the anaemia following malarial infections. Phenylhydrazine can raise the biotin-level of plasma, and chickens infected with *P. lophurae*, when treated with this substance, have been shown to develop less severe infections than control birds, a fact which may be connected with the preference of this parasite for mature erythrocytes or, in the author's view, to increase in level of plasma biotin. On the other hand canaries infected with *P. cathemerium* have more severe infections following treatment with phenylhydrazine. It is possible that the preference shown by different species of malaria parasites for old or young red cells may be associated with the different biotin content of these cells. A simple theory in explanation of the author's results is that biotin is an essential growth factor for malarial parasites with a certain optimal range of concentration. He points out, however, that much more experimental work is required. The specific relationship between certain nutritional deficiencies and degree of susceptibility of the host to various other infections is discussed.

[The yeast-growth substance biotin, first isolated from egg yolk by KOGL, has been shown by DU VIGNEAUD and collaborators to be identical with vitamin H. This name was given by GYORGY to the factor present in liver, yeast and various foods which was capable of preventing the fatal syndrome which results from the giving of large amounts of raw egg white to all species studied. Biotin was shown to be involved in animal metabolism and came to be recognized as a member of the vitamin B complex. Its rôle in nutrition is not yet fully known. Du Vigneaud, 1942, and his collaborators suggested the chemical structure of this substance and HARRIS *et al.*, 1943, very recently showed, by a total synthesis of biotin, that the assigned formula was correct.] *J. D. Fulton.*

BLACKWATER FEVER.

MAEGRAITH, B. G., MARTIN, N. H. & FINDLAY, G. M. **The Mechanism of Red Blood Cell Destruction.** *Brit. J. Exper. Path.* 1943, Apr., v. 24, No. 2, 58–65.

A 10 per cent. suspension of washed red cells from monkey or guineapig was made in sterile 0·85 per cent. saline, with or without 5 per cent. glucose or buffered phosphate. Slices of various tissues (4 mm. × 4 mm. × 2 mm.) from an exsanguinated homologous animal were then washed in fluid corresponding to that used for suspending the red cells. On incubating the cell suspension (1 cc.) at 37°C. in the presence of the slices of washed tissues (in 1 cc. of the corresponding fluid) haemolysis occurred. To obtain constant results strict asepsis, chemically clean glassware and a *p*H of 7·1 were necessary conditions; the tissues were also kept on ice in the interval between removal and use. For the following reasons it was considered that the haemolysis was produced by an enzyme—an erythrocytase—from the tissues. First, the time relations of the lysis were similar to those of an enzyme-substrate reaction, the rate of lysis being slow at first, then more rapid for a few hours, being maximal between the 15th and 24th hours, and

finally becoming slow again ; secondly, lysis was prevented by the previous heating of the tissues to 80°C. ; thirdly, traces of potassium cyanide or low concentrations of mercuric chloride inhibited the lysis ; and fourthly, the lytic agent was found to be species specific and to be inhibited by titrable concentrations of serum. It seems unlikely that the lytic agent was only a product of tissue autolysis, because after dissection the tissues were used as soon as possible—always within two hours, during which time they were kept on ice ; also the lytic agent appeared to be species-specific and was inhibited by serum. Furthermore, tissues removed, after having been 18 hours in a haemolytic system, produced lysis in a fresh system in the same time as did fresh tissues. Finally, terminal washings from intact animals contained the lytic agent. In the circulating blood and in unwashed tissues there was a non-species-specific inhibiting factor which inhibited the activity of the tissue lysin ; the inhibiting factor appeared to withstand drying as it was present in reconstituted plasma. The degree of lysis occurring normally in the body may depend on the interaction of lytic agent and inhibitor, and disturbances of their balance may be associated with lysis in such conditions as blackwater fever, malaria and other lytic anaemias. [For a previous note see this *Bulletin*, 1943, v. 40, 440.]

F. Murgatroyd.

Burkwall, H. F. **Blackwater Fever. A Statistical Report on Twenty-Five Cases seen on Hainan Island.** *Amer. J. Trop. Med.* 1943, Mar., v. 23, No. 2, 285–92, 2 figs. [18 refs.]

Of 25 patients seen on Hainan Island suffering from blackwater fever 24 were natives, and all were former residents of Nodoa. All had been subject to frequent attacks of malaria for which they were accustomed to take quinine, and in none was any idiosyncrasy to the drug established. There were 15 male patients and 10 female, and six were under 15 years of age. A previous attack of blackwater fever had occurred in three patients, of whom two died, while of those suffering their first attack, four died. *P. falciparum* was found in 17 of the patients. Treatment of the blackwater fever included rest, fluids, alkalis and haematinics. Atebrin, 0·1 gm. twice daily, was given to 15 patients for the first three days when haemoglobinuria was present, while some received quinine, 5 grains intramuscularly on entry into hospital and in increasing doses by mouth when the urine had cleared. Among a total of 913 patients admitted to the hospital between April 1st, 1940, and February 1st, 1942, there were 325 suffering from malaria without blackwater fever and 22 from blackwater fever.

F. Murgatroyd.

LEISHMANIASIS.

VILANOVA, J. Fundamentos, técnica y resultados obtenidos en el tratamiento intralesional del botón de Oriente con un nuevo preparado de antimonio a alta concentración. [**Technique and Results of Infiltration of Oriental Sore with a New Antimonial Preparation.**] *Rev. Clín. Española.* 1943, Jan. 15, v. 8, No. 1, 21–8, 3 figs.

The author, having noted that the local treatment of oriental sore by infiltrating the lesion with a solution of atebrin as recommended by FLARER [this *Bulletin*, 1939, v. 36, 454] was liable to be followed by serious local reactions, was led to substitute solustibosan in an attempt to discover a less irritating solution for local injection. After some experimentation he found that a new concentrated form of solustibosan which contains 100 mgm. of pentavalent antimony in place of the usual 20 mgm. per cc. gives very satisfactory results. The dose employed is 0·4 cc. per 10 kgm. of body weight, but a total dose of 2 cc. must not be exceeded. If there are not more than three sores this quantity may be sufficient to infiltrate completely all the lesions at one operation, but in young patients with a body weight of not more than 10 kgm. infiltration will have to be undertaken on more than one occasion if more than one sore is present. If many sores are present local treatment is hardly feasible. In such cases the author prefers generalized treatment with injections of fouadin or neostibosan. Though the local treatment is not entirely free from pain, it has the great advantage that the injections into the sore have to be given only once. The parasites disappear from the sore in 24 hours and without further interference healing with little and inconspicuous scarring takes place in two or three months. *C. M. Wenyon.*

FEVERS OF THE TYPHUS GROUP.

PHILIP, C. B. **Nomenclature of the Pathogenic Rickettsiae.** *Amer. J. Hyg.* 1943, May, v. 37, No. 3, 301–9. [38 refs.]

This is a very interesting discussion on the nomenclature of the Rickettsiae of the fevers of the typhus group. The author makes no claim to finality for the names suggested, because information about the organisms and the diseases caused by them is still incomplete. The numerous names that have been proposed are critically examined and an effort is made to select those that conform to the accepted rules of nomenclature. It is not practicable to give an adequate abstract of the contents of the paper, but the following summary of the classification proposed by the author is of general interest. The classification is associated with the arthropod vectors concerned in the transmission of the various Rickettsiae.

TABLE.

Family Rickettsiaceae Pinkerton, 1936. *Genus* Rickettsia *da Rocha Lima*, 1916.

Subgenera	*Rickettsia*		*Dermacentroxenus* Wolbach, 1919.	*Coxiella* Philips, 1943 (of the Q fever group)
Species	*R. prowazekii* da Rocha Lima, 1916 (of the typhus-fever group)	*R. orientalis* Nagayo *et al.*, 1930 (of the tsutsugamushi fever group)	*D. rickettsi* Wolbach, 1919 (of the Rocky Mountain spotted fever group)	*C. burneti*† Derrick, 1939 (synonym *C. diaporica*† Cox, 1939)
Subspecies	*R. prowazekii* (of epidemic typhus) / *R. typhi** Wolbach and Todd, 1920 (of endemic typhus)	Nil.	*D. rickettsi* (of Rocky Mountain, Brazilian, and Colombian spotted fevers) / *D. conori* Brumpt, 1932 (of boutonneuse fever, Kenya typhus, and tick-bite fever)	Nil.

*The original name was *Dermacentroxenus typhi*.

†The original names were *Rickettsia burneti* and *R. diaporica*.

Among the numerous synonyms for the Rickettsia of endemic, flea-borne, typhus the name *Rickettsia typhi* is regarded as having priority. The name *Dermacentroxenus typhi* was given by WOLBACH and TODD in 1920 to the parasite of Mexican typhus, which is commonly regarded as being the same as endemic typhus. As the organism is a true Rickettsia " the name is perfectly valid, transferred to Rickettsia " and becomes *R. typhi* (Wolbach and Todd) or *R. prowazekii*, subspecies *typhi* (Wolbach and Todd).

The name *Dermacentroxenus* is adopted for the organisms of the fevers of the Rocky Mountain spotted fever type, apparently on the assumption that these organisms, because of their intranuclear habitat, are properly regarded as belonging to a separate subgenus of the genus *Rickettsia*.

The name *R. orientalis* given to the mite-borne Rickettsiae is likely to meet with general acceptance. There will be differences of opinion about the necessity for establishing a new subgenus for the organisms of Q fever in spite of the fact that this parasite differs from the other Rickettsiae in being consistently filter-passing and in causing a disease without rash and without agglutinins for any of the known forms of Proteus.

[It is surprising to learn that observance of the rules of nomenclature necessitates consideration for such unsuitable names as *R. megawi* var. *pijperi*, and *R. megawi* var. *fletcheri* proposed by AMARAL and MONTEIRO in 1930. The author, happily, finds justification for the view that " they may be sunk, for the present " as being presumably synonyms of the earlier names *R. conori* and *R. orientalis*.

Unless clear evidence is produced that the Rickettsiae of the typhus group comprise separate subgenera, most workers will prefer to use the widely accepted nomenclature and call the organisms *Rickettsia prowazeki*, *R. mooseri*, *R. orientalis*, *R. rickettsi*, and *R. burneti*; adding, when necessary, subtitles to indicate varietal differences.

If names like *Dermacentroxenus* and *Coxiella* are accepted it will be necessary to make a drastic revision of the nomenclature of the Rickettsiae in general. As the reviewer has already pointed out, it would be anomalous to use the name *Rickettsia quintana* for the parasite of trench fever and the name *Dermacentroxenus rickettsi* for that of tick-borne typhus fever. The subdivision of the genus Rickettsia into subgenera would, therefore, involve the use of a new subgeneric name for the organism of trench fever. This might be *Fossilis quintana*, but it is to be hoped that this complication may be avoided.

The author excludes the tick typhus of India from the list of tick-borne Rickettsial fevers on the ground that the disease is " more recently thought to be mite-borne." Presumably he has not seen the original accounts of the disease by the reviewer or the other clear evidence of the occurrence of tick-borne typhus in India. Mite-borne typhus, and also flea-borne typhus, almost certainly occur in India, but the evidence that foci of tick typhus also exist is even stronger, though much of it is more than twenty years old. It would be very surprising if any of the fevers of the typhus group were found to be absent from the sub-continent of India with its great range of climatic conditions and its geographical situation between the Near and the Far East.

In spite of the debatable points the paper is a valuable contribution to the nomenclature and classification of the fevers of the typhus group.] *John W. D. Megaw.*

v. BAEYER, W. Geistige Störungen bei Fleckfieber. Zugleich ein Beitrag zur Lehre von den Konfabulationen. [**Mental Disturbances in Typhus Fever. With a Note on the Confabulatory Psychosis.**] *Ztschr. f. d. gesamte Neurol. u. Psychiatrie.* 1942, Dec. 30, v. 175, No. 1 & 2, 225–55.

This article of thirty pages was written by a psychiatrist for psychiatrists. By far the greater part deals with six cases of a "confabulatory psychosis" in German soldiers convalescing from typhus fever. All the patients gave vivid and circumstantial accounts of imaginary feats of prowess for which five of them claimed to have been rewarded by distinguished decorations and by promotion to commissioned rank or to important posts. The condition resembled Korsakoff's syndrome, but apart from the grandiose delusions the mental condition of the patients was normal or only slightly affected.

While under observation some improvement was observed, but the after histories are not mentioned. The nature of the psychosis is discussed at great length; special emphasis is laid on the toxic factor; the anatomical changes in the small vessels of the brain are hardly mentioned. The resemblance to poisoning by cannabis indica is noted. Evidently the higher brain centres concerned with self criticism are thrown out of action; so that day-dreaming, wishful thinking, and naïve fantasiés assume uncontrolled mastery.

Brief reference is made to the countless psychic and other nervous disturbances seen during the acute stage of the disease and in early convalescence. Among those mentioned are: apathy, somnolence. coma, delirium—sometimes low muttering, sometimes violent—loss of orientation in time and place, insomnia, coma vigil, catalepsy, tics, muscular twitching, choreiform movements, incoordination, Parkinsonism, mutism, deafness, hypochondriasis, depressive or anxiety states, expansive euphoria, embolic hemiplegia, optical and auditory hallucinations, paranoia, schizophrenic symptoms, suicidal impulses, etc.

One patient temporarily assumed the personality of a friend, including his birthplace, previous occupation, religion, etc.

Most of the psychoses are due to encephalitis; none of them, with the possible exception of "confabulosis," is specifically connected with typhus fever, though mental aberrations are exceptionally frequent in typhus and tend to persist for some time after defervescence.

[The article contains internal evidence suggesting that the author has had extensive recent experience of typhus fever in German soldiers.]

John W. D. Megaw.

LAMPERT, H. Der Blutdruck Fleckfieberkranker und seine Beeinflussung durch das Ueberwärmungsbad. [**The Blood Pressure of Typhus Patients, and how it is affected by the Hot-Bath Treatment.**] *Deut. med. Woch.* 1943, Jan. 15, v. 69, No. 2, 33–4, 4 figs.

This article has presumably been written as an answer to criticism directed against the hot bath treatment which was advocated in a paper by the author, who stated that he had already administered more than 2,500 hot baths [see this *Bulletin*, 1942, v. 39, p. 824].

LAURENTIUS, in a later paper, raised the objection that hot baths would cause a dangerous fall in the blood pressure; he also opposed the author's view that collapse of the peripheral circulation, rather than heart failure, was the chief cause of death in typhus [see this *Bulletin*, 1943, v. 40, 445].

In the present paper seven charts are reproduced ; they have been selected from a large series of records of the blood pressure, temperature, and pulse, of typhus patients. The observations were made five to seven times daily in each case. It is claimed that these charts demonstrate the occurrence of a reflex rise in the blood pressure after the hot bath. [They also show that the diastolic pressure often fell to zero while the patients were still in the bath. Sceptics are not likely to be convinced of the value of the treatment by the evidence now produced.] *John W. D. Megaw.*

ROSE. Fortschritte in der Bekämpfung der Kleiderlaus. [**Advances in the Control of the Body-Louse.**] *Reichs-Gesundheitsblatt.* 1943, Feb. 3, v. 18, No. 5, 53–7.

The most outstanding advance in typhus control in this war, as compared with the last, is in the use of inoculation. Nevertheless, in spite of excellent organization, this protective measure can be only of limited value and cannot be used wholesale to quell epidemics.

The old saying, "No lice, no typhus," is unchanged ; for the recently observed laboratory transmission of typhus by other means has little bearing on the practical problem. The transmission by infected louse faeces also is of minor importance in the spread of epidemics. Some records of such dust infection early in the war rest on very unreliable evidence. (Thus the finding that a typhus patient was louse-free might be accounted for by a change of clothes since being bitten by an infected louse eight days earlier.) It must be emphasized that typhus epidemics are essentially spread by the lice themselves, which are extremely easy to acquire unnoticed.

Reports of infection by louse faeces have obscured the main object of disinfestation. The object is to stop lousiness among the general community, not to kill a few infected lice. A typhus case in a louse-free community is no danger. *Disinfection* measures therefore are not required in general delousing and only complicate the procedure.

The best methods of delousing used in the last war (hot air and HCN) are still used. The ordinary hot air chamber is very widely employed, on account of its simplicity. Circulating hot air systems are a considerable improvement in efficiency and speed of operation (treatment time reduced to one hour). A suitable apparatus is made by the firm John of Efurt. An easily transportable hot air chamber with still air has, however, the advantage that it can be taken to the outbreak centre and avoids the necessity for infested people to travel to the disinfesting station.

Hot air disinfestation is unsuitable for many articles made of rubber, leather and their substitutes. For example, it has been found that 35°C. is the highest temperature to which leather can periodically be exposed without deterioration. The most reasonable alternative is fumigation.

Hydrogen cyanide fumigation is most efficiently done by the Degesch circulation system. The use of this gas must, however, be limited to experienced operators, on account of its danger. Also the exposure necessary at low temperatures is too long.

A very effective penetrating gas is "Ventox", but it is inflammable and rather dangerous : it lacks a warning odour and is toxic to man. These difficulties can be overcome by mixing "Ventox" with

" Tritox "* in the ratio 2 : 3. " Tritox " alone is not sufficiently toxic to louse eggs but it has a strong odour and is non-inflammable.

This mixture, called T.V., is most effective when the gas chamber is warmed to 30°C.—a temperature which does not call for much fuel.

The preparation " Illo " can be used for delousing when the temperature is suitable and the time available. " T-gas "* is also effective, but requires the transport of metal cylinders. " Areginal,"* the grain fumigant, can be used for delousing. It is excellent in penetrative, powers and does not damage clothing, but it requires rather a long exposure.

As regards body applications for delousing, the grey ointment commonly recommended is in short supply. Two substances with physical as well as chemical action are Pumice-oil-soft-soap mixture (3 : 2 : 1) and Pumice-soda-whiting mixture (2 : 1 : 3). To this class of insecticide belongs the widely used " Antiparasit-W."

Methyl salicylate has a temporary action in cleansing body hair, and " Lausex " [see *Bull. of Hyg.*, 1943, v. 18, 65] is very effective, though it does not kill nits. Supplies of " Lausex " are, however, limited by shortage of ingredients.

Anti-louse powders are useful because of their simplicity in application ; but if they are applied unevenly, the nits will escape. Certain xanthogenates are used in this form, but are not popular in Germany because of their disagreeable smell. The preparation known as " Aulinogen "* (bisethylxanthogen) is confined to veterinary use. The smell has not deterred the Russians from using xanthogenates, however, especially in the " K-soap " of the Soviets. It was believed that here was a quite new pediculicide until closer examination proved it to be an insecticide well known to German doctors. Practical experience in the Army has shown that the repulsive smell is a very real disadvantage.

The use of xanthogenates in soap form by the Soviets suggested the possibility of impregnating garments with anti-louse insecticides. Recent work in Germany has produced two substances which will shortly be used in this way. Indefinite protection cannot be expected, but the impregnation may be repeated by the men themselves at intervals.

It should be mentioned that dry cleaning of clothes by fat-solvents, especially with addition of " Tetromin," is an adequate delousing measure.

The delousing of bodies, clothes and equipment are primary measures. But there may also sometimes be good reasons for disinfecting barracks, railway coaches, etc. Pyrethrum sprays should not be used for this purpose ; they are needed elsewhere. An alkaline cresol preparation can be used for scrubbing, or a sulphur dioxide fumigation carried out. *J. R. Busvine.*

Brazzaville [Afrique Française Libre] : Rapport sur le Fonctionnement Technique de l'Institut Pasteur en 1941 [Ceccaldi, J., Director]. 39–42. Fièvres exanthématiques. **[Exanthematic Fevers in Brazzaville, 1941.]**

Fevers of the typhus group are not uncommon in Brazzaville, the capital of French Equatorial Africa, situated about 5 degrees south of

*[The abstracter has reason to believe that " Tritox "=trichloracetonitrile ; " T-gas "=a mixture of ethylene oxide and carbon dioxide ; " Areginal "=is basically methyl formate.

It is also understood that bisethylxanthogen is liable to cause dermatitis.]

the equator, having a mean temperature of 77°F. and a rainfall of about 90 inches.

Few cases were seen at the Pasteur Institute in 1941, but in previous years numerous cases had been observed ; they were regarded as being of the murine type, though complete proof was lacking. MOUSTARDIER in 1942 reported a case which he regarded as murine, but he stated that he had observed a good many cases believed to be tick-borne [see this *Bulletin*, 1943, v. 40, 594].

Of the five cases of typhus-like fever seen in 1941 two gave negative Weil-Felix reactions and negative results to guineapig inoculations ; in one, *Proteus OX19* was agglutinated, 1–100, but no animal experiment was carried out.

An indigenous patient had fever lasting three weeks ; no rash could be seen. The agglutination responses on the 22nd day were—to *OX19*, ++1–200, ++1–500 and +1–1,000 ; to *OX2* and *OXK*, ++1–200. Two and a half months later the reactions were negative except for a partial response to *OX19* (+1–200). Eight rats from the patient's hut and a nearby grain store, as well as a number of rats from the immediate neighbourhood, were investigated by guineapig inoculation, with negative results.

Samples of blood were taken from 15 persons in the vicinity ; in one of these there was a positive reaction to *OX19*, 1–200, on three separate occasions ; this was attributed to an inapparent attack, but guineapig inoculations on two occasions were negative.

The author concludes from these and previously observed cases that murine typhus is endemic in Brazzaville, and that inapparent attacks may occur.

[The fevers of the typhus group of tropical West Africa are still something of an enigma.] *John W. D. Megaw.*

ESKEY, C. R. **Murine Typhus Fever Control.** *Pub. Health Rep.* Wash. 1943, Apr. 16, v. 58, No. 16, 631–8.

During the 10-year period 1932–41 about 20,000 cases of murine typhus fever have been reported in the U.S.A. : there were 2,700 cases in 1941, and 3,700 in 1942. The real number must have been much larger ; in certain areas a detailed survey showed that only about one-fifth of the cases had been notified.

The disease is by no means trifling ; after the age of 60 the prognosis is not good, and young patients are acutely ill for two weeks. Convalescence is slow, lasting nearly two months.

Most of the cases are traceable to domestic rats. The disease is far more prevalent in the south, where rat infestation is intense and widespread, and climatic conditions favour the flea vector. In the north the disease occurs chiefly in large urban communities, and rat infection is restricted to certain buildings which have a dense rat population.

Rat control is on orthodox lines : poisoning, as a rule, is the least costly method, but when food is easily accessible to the animals spring traps are most effective. Local and temporary measures of rat control may be adequate in the north but are useless in the south, where rat proofing and rat destruction must be thoroughly carried out. " Exterior " rat proofing, if combined with rat destruction, is adequate and is much less expensive than complete rat proofing, which is a costly

process in old buildings. The work must be done by trained persons, preferably by the staff of the public health service.

John W. D. Megaw.

PARKER, R. R., KOHLS, G. M. & STEINHAUS, E. A. **Rocky Mountain Spotted Fever: Spontaneous Infection in the Tick** *Amblyomma americanum*. *Pub. Health Rep.* Wash. 1943, May 7, v. 58, No. 19, 721–9.

The Rickettsia of Rocky Mountain spotted fever has been recovered from a batch of 114 nymphs of *Amblyomma americanum* collected in Oklahoma in September 1942 from vegetation in a wooded pasture close to the home of a child convalescing from spotted fever.

The author and others had already recorded cases in which this tick was the probable vector of the disease, but the evidence was incomplete. In the present investigation the Rickettsia was recovered from a guineapig on which the nymphal ticks had been fed.

The following points connected with the investigation deserve attention; some of them ought to correct certain misconceptions which are still current with regard to the tick-borne fevers of the typhus group. Of the 15 guineapigs employed in making passages of the Rickettsia none died, none had a scrotal reaction, and two had no fever. These two must have had inapparent attacks because one of them was afterwards found to be immune to spotted fever and the other to boutonneuse fever. The average duration of the fever in the passage guineapigs was five days. Rickettsiae were found in the cytoplasm of the cells of the infected animals, and occasionally appeared to be intranuclear in the cells of the peritoneum and tunica. There was complete reciprocal cross immunity between animals infected with the Rickettsiae and those infected with (*a*) three virulent strains of Rocky Mountain fever, (*b*) boutonneuse fever, and (*c*) South-African tick-bite fever and "*maculatum*" infection [this *Bulletin*, 1940, v. 37, 254]. Spotted-fever vaccine completely protected guineapigs against the infection, and as this vaccine does not protect against boutonneuse or tick-bite fever the strain of Rickettsia was clearly of the Rocky Mountain fever type.

Fifteen guineapigs, after recovering from epidemic typhus, were inoculated with the Rickettsiae; six remained afebrile, and nine had fever which lasted, on the average, just over three days; in the reverse test four of twelve animals remained afebrile, the others had fever lasting, on the average, 3·62 days. [This suggests a partial degree of cross immunity between louse-borne and tick-borne typhus fevers.]

Guineapigs recovered from endemic typhus were susceptible to the Rickettsia infection; in the reverse experiment two of four animals remained afebrile, and the other two had fever lasting three and six days.

There was no cross immunity with American Q fever.

The paper contains an account from various sources of two remarkable outbreaks of Rocky Mountain spotted fever. In one, all the six members of a household and the visiting physician, at Armstrong, Oklahoma, were attacked, within a period of 32 days, after bites by ticks which, almost certainly, were *A. americanum*. In late September, a few days after the occurrence of the last attack, strains of Rickettsiae having the characteristics of the Rocky Mountain fever type were recovered by HASSLER and his colleagues from pocket gophers (probably

Geomys breviceps dutcheri) caught on the premises, and from ticks (*A. americanum*) collected from the gophers. This was the first time that Rickettsiae of the Rocky Mountain-fever type have been recorded as being isolated from naturally-infected mammals in the U.S.A.

The other outbreak was in Texas. Twelve children were camping on a cattle pasture heavily infested with *A. americanum*; four of the children were attacked within a period of five days, after numerous bites by adult and nymph ticks. Rickettsiae of the Rocky Mountain fever type were isolated from two of the patients by ANIGSTEIN and BADER.

The occurrence of two cases of the disease in one household during one tick season is not uncommon; there are several records of three such cases, and one record of four cases; but seven cases within 32 days would seem to indicate some unusual epidemiological condition. The factors concerned may be the readiness with which larvae and nymphs of *A. americanum* bite human beings, and the occasional occurrence of immense concentrations of the nymphs of these ticks in relatively small areas. Transmission of infection by *A. americanum* may be favoured by the frequent infestation of dogs and cats by this tick, which is thus brought into close contact with human beings. On the other hand, immature ticks of this species feed chiefly on horses and cattle, which are not supposed to be susceptible to the disease, whereas the larvae and nymphs of the other two vectors, *Dermacentor andersoni* and *D. variabilis*, feed almost exclusively on susceptible small animals.

In 1941 about 5,000 specimens of *A. americanum* (larvae, nymphs, and adults) collected in Texas, Oklahoma, Arkansas, and Missouri, were tested without obtaining convincing evidence of infection in any of the several hundred guineapigs that were used, though many of the animals had febrile attacks, a few had scrotal swelling, and a few were later found to be immune to spotted fever.

[From this and other large-scale experiments that have been recorded it would appear that there is little hope of isolating Rickettsiae from the ticks of endemic areas except by immediate investigation in the vicinity of human attacks of the disease.] *John W. D. Megaw.*

EDDY, G. W. **Notes on the Seasonal History of the Rabbit Tick, *Haemaphysalis leporis-palustris*, in Oklahoma.** *Proc. Ent. Soc. Wash.* 1942, v. 44, No. 7, 145–9, 1 map. [Summary taken from *Rev. Applied Entom.* Ser. B. 1943, July, v. 31, Pt. 7, 130.]

Notes are given on the importance of *Haemaphysalis leporis palustris*, Pack., as a vector of tularaemia and Rocky Mountain spotted fever, its distribution in America and in Oklahoma, and its hosts. It chiefly infests rabbits and hares, but birds are also important hosts of the immature stages, and the author has collected larvae and nymphs in Oklahoma from various other rodents, skunk and domestic cat. To determine its seasonal distribution in Oklahoma, 5–32 cottontail rabbits (*Sylvilagus floridanus alacer*) were collected each month in Payne county throughout 1939. Ticks were found on them in every month, the average number per rabbit varying from 2·80 in December to 115·56 in June. Larvae and nymphs were taken in all months, but no adults were taken in December and very few in November, January and February. These findings are compared with those of other workers in the United States.

TOPPING, N. H. **Rocky Mountain Spotted Fever. Further Experience in the Therapeutic Use of Immune Rabbit Serum.** *Pub. Health Rep.* Wash. 1943, May 14, v. 58, No. 20, 757–75, 4 figs. [10 refs.]

The experiments described in this important paper justify the guarded opinion expressed by the authors that immune serum, especially if administered early, offers hope of success in the treatment of Rocky Mountain spotted fever.

Rabbits were immunized with equal success by injections of living and highly virulent Rickettsiae obtained from two different sources : (*a*) infected ticks, as already used by the author in experiments on similar lines in 1940, and (*b*) yolk-sac cultures, as employed in the same year by KUROTCHIN, VAN DER SCHEER, and WYCKOFF. The sera were concentrated and purified by the methods used in connexion with antipneumococcal serum and already adopted for anti-Rocky Mountain fever serum by Kurotchin and his colleagues. The serum used in the present human tests and in some of the animal experiments was actually prepared by Wyckoff.

The results obtained are briefly summarized as follows :—

(1) A single injection of 0·5 cc. of the purified serum, given on the first day of fever (72 hours after inoculation), prevented death and scrotal reaction in guineapigs which had been inoculated with a highly virulent strain of the Rickettsiae.

(2) The same dose had little or no effect when given on the second day of the fever.

(3) Comparable results were obtained from doses of 4·0 cc. in monkeys weighing about eight pounds.

(4) Single doses of 3·0 to 5·0 cc. caused demonstrable effects when given to guineapigs 120 hours after inoculation (the second day of the fever). All the four animals given these doses recovered, and none had a scrotal reaction.

(5) The serum was then tried in 71 cases of Rocky Mountain spotted fever in patients from various Eastern and Western States of the U.S.A. None of these patients had previously been inoculated. The dosage was about 1·0 cc. per kilo. body-weight. The intramuscular route was chosen and a preliminary conjunctival test was made for sensitiveness to rabbit serum. The dose was given in stages ; 1·0 cc. at first ; 5·0 cc. ten minutes later if no reaction occurred ; then, after a further interval of ten minutes, the rest of the dose was given unless it exceeded 40 cc., in which case the remainder was given about twelve hours later.

In 52 of the cases the serum was given on, or before, the third day of the rash ; there were two deaths.

In 19 cases it was given later, and in this series also there were two deaths.

Analysis of the case-fatality rates over a period of ten years in the areas concerned showed that the expected deaths, apart from this treatment, would have been nearly ten in the former series, and four in the latter.

So great a reduction in the case fatality in the former series would occur only once in one hundred times by chance alone.

The only untoward reaction was urticaria, which occurred in twelve patients.

The preference for the intramuscular route was based on the general opinion held by those interested in the disease that intravenous

medication of any kind may be contraindicated. R. R. PARKER is quoted as stating in a personal letter that "We have used glucose in guineapigs with the usual result, namely earlier deaths than in the controls."

These experiments have an important bearing on the prospects of obtaining an effective antityphus serum, and the comments on intravenous medication deserve attention. For work on antityphus serum in North Africa see this *Bulletin*, 1942, v. 39, 543.

John W. D. Megaw.

v. BORMANN, F. Febris neuralgica periodica (Wolhynisches) Fieber, Fünftagefieber. **Febris Neuralgica Periodica (Trench Fever).** *Deut. med. Woch.*, 1943, Apr. 30, v. 69, No. 17/18, 356–9, 4 charts.

Although this paper throws little fresh light on trench fever it gives a good description of the symptoms observed in an epidemic among German soldiers in North Russia during the late autumn and winter of 1941–42.

Prodromal symptoms were rare. The onset was very sudden, with rigor or chill, and the temperature rose rapidly to 39° or 40°C. In many cases a brief febrile period was followed by sudden defervescence with sweating so that a malarial paroxysm was simulated.

The types of fever observed were :—

(1) The abortive short-fever type (in about 40 per cent. of the cases) : the fever lasted from less than one day up to three days and was followed by complete convalescence within a few days. These cases were usually regarded as influenza.

(2) The classical periodic type (31·5 per cent.) : with short paroxysms of fever or waves of low fever which recurred at irregular intervals. The fever free periods usually lasted three to five days. The paroxysms usually, but not always, became progressively less severe, and did not exceed five in number.

(3) The persistent-fever type (18·5 per cent.) : in which the usual initial paroxysm was followed by persistent fever for periods ranging from a week to several months. The fever was sometimes continued, resembling typhoid ; sometimes intermittent ; and sometimes irregular.

(4) The rudimentary type (10 per cent.) : in this there was little or no fever, but neuralgic pains lasted two to seven days.

The epidemiological conditions and the clinical picture left no room for doubt that all these types were variants of the same disease. The non-periodic cases were more than twice as numerous as the periodic, so that the new name proposed by the author—"febris neuralgica periodica"—seems to be quite as unsuitable as the various other names used by German authors ; it has the added disadvantage of being unfamiliar. Pains in the shin bones or calves occurred in only about half of the cases. The neuralgic or myalgic pains affected various muscle groups ; they varied from slight "rheumatic" pains to severe stabbing or boring pains in the limbs, seldom in the joints, and occasionally affected only one side of the body. The symptoms sometimes suggested meningismus or renal colic. Most of the patients felt ill and depressed. Splenic enlargement was detected by percussion in about one-third of the cases. No eruption was seen. The pains did not always subside during the afebrile intervals ; sometimes they became worse. In the prolonged attacks the patients lost weight, and had night sweats in many cases. Occasionally there was a neurasthenic condition

and delayed convalescence. Five cases of second attacks were seen within a period of three and a half months ; apparently convalescents may harbour the Rickettsiae for many months.

The diseases simulated were :—influenza, malaria, relapsing fever, typhus, typhoid, encephalitis, undulant fever, tuberculosis, muscular rheumatism, and chronic septic infection.

The " Bessarabia fever " described by BOEHNHARDT in 1942 may well have been trench fever.

[BOEHNHARDT (below) describes a fever which never lasted more than a week, and in which there were invariably two febrile paroxysms. These features suggest a fever of the dengue group rather than trench fever.]

The epidemiological conditions and the occurrence of some cases of the periodic type give clues to the diagnosis.

No drug has been found to have a specific action.

The source of the infection is considered to have been Russian troops, and the local inhabitants among whom the disease exists in endemic form without being recognized. *John W. D. Megaw.*

BOEHNHARDT, H. Eine eigentümliche Fiebererkrankung in Bessarabien. [**A Peculiar Febrile Disease in Bessarabia.**] *Deut. Militärarzt.* 1942, May, v. 7, No. 5, 291–4.

An outbreak of a short fever of doubtful origin is described. Sixty cases were observed in German soldiers in the Dniester River region of Bessarabia during a spell of hot and dusty weather. No cases were seen in the cool and rainy days of the same [unspecified] month.

In all the cases there were two spells of fever, separated by a fever-free interval, during which the symptoms did not completely disappear. In most of the cases both spells of fever were short, apparently they lasted one day or less ; the second spell was less severe than the first. The onset of each spell was sudden, with intense frontal headache and shivering or rigor. There were severe pains in the loins, and in two-thirds of the cases there was tenderness over the rectus abdominis muscles. There were redness and swelling of the mucosa of the throat, but no symptoms referable to the tonsils, thoracic or abdominal viscera.

The fever-free interval lasted four or five, rarely six, days, and the total duration of the attack was five to seven days.

In a few cases the initial fever lasted three days and ended by lysis, but after two days of freedom from fever the terminal rise occurred as in the other cases.

Infrequently there were " rheumatoid " pains in the knee, ankle, or wrist joints for two days after defervescence. In another group of 19 patients, who had suffered from similar attacks but were not seen till after the end of the fever, there were severe pains in the muscles of the back, chest, or neck, beginning 10 to 14 days after defervescence, and lasting five to six days. There was no rash. The leucocyte count did not exceed 6,000 to 8,000, even during the febrile periods.

The disease differed from sandfly fever in the occurrence of a secondary rise of temperature, and in the absence of bradycardia, anorexia, and conjunctivitis. It differed from dengue in the absence of rash and relative lymphocytosis. It differed from both of these diseases in the rapid establishment of complete convalescence. No definite statement

could be made about transmission by sandflies, but all the patients denied having been troubled by insect bites.

Although sandfly fever and dengue could not be excluded with certainty it was considered more likely that the disease was of a special type and was caused by a virus inhaled with dust.

If mosquito or sandfly transmission could not be excluded the most likely diagnosis would seem to be a fever of the dengue-sandfly fever group. There are records of outbreaks of undoubted dengue in which the rash has been detected in less than 10 per cent. of the cases, and this disease is notoriously variable in its clinical features. The present outbreak shows all the characteristics that are invariably seen in dengue so it may have been a new variant of that fever rather than a new disease. In sandfly fever secondary rises of temperature are by no means rare, though their occurrence in all the cases would be distinctly surprising. The suggestion by v. Bormann (above) that the disease may well have been trench fever strikes the reviewer as being far-fetched.] *John W. D. Megaw.*

YELLOW FEVER.

Penna, H. S. & Bittencourt, A. **Persistence of Yellow Fever Virus in the Brains of Monkeys immunized by Cerebral Inoculation.** *Science.* 1943, May 14, 448–9.

"Persistence of virus in the body of the host after infection, despite a refractory state to reinfection from without, has been shown to occur in the case of a number of viruses, and it has been suggested that lasting specific immunity following some virus diseases depends on this persistence." Psittacosis, salivary gland virus infection of guineapigs, encephalomyelitis and herpes are cases in point.

Yellow fever vaccine is prepared from the active, attenuated, strain 17D, and a *rhesus* monkey is inoculated intracerebrally as a test of each batch. The animals usually react with fever of short duration, followed by recovery, with the appearance of specific neutralizing antibodies in the blood, but sometimes they show symptoms of involvement of the central nervous system.

Some of the animals used for these tests died, apparently of generalized tuberculosis, and attempts were made to isolate the virus from their brains by injection of brain material intracerebrally into mice. Strains identified immunologically as yellow fever virus were identified from three monkeys which died 63, 93 and 159 days after inoculation. There was some indication that the amount of virus varied according to the length of time since inoculation; at 63 days all the mice injected were dead by the ninth day, at 93 all were dead by the thirteenth day, at 159 days only three of 12 mice developed encephalitis.

Five other monkeys were killed 100 days after inoculation, but no yellow fever virus was recovered; two others were given intracerebral starch injections 161 and 170 days after inoculation, in an attempt to localize possibly existing virus; the results were negative.

It is suggested that the tuberculous infection may have had some effect in unmasking a latent virus in the three positive monkeys.

C. W.

PLAGUE.

STEWART, M. A. **Present Knowledge of the Status of Vectors of Sylvatic Plague in North America.** *Proc. 6th Pacif. Sci. Congr. 1939.* v. 4, 433–7. [Summary taken from *Rev. Applied Entom.* Ser. B. 1943, July, v. 31, Pt. 7, 132.]

The following is based on the author's summary. The presence of sylvatic plague has been demonstrated in California, Oregon, Washington, Idaho, Nevada, Utah and New Mexico in North America, and 21 species of rodents have been found with anatomical lesions or bearing infected fleas. As the most widely distributed fleas among these rodents are *Ceratophyllus* (*Diamanus*) *montanus*, Baker, *C.* (*Oropsylla*) *idahoensis*, Baker, and a subspecies of *C.* (*Orchopeas*) *sexdentatus*, Baker, it is considered that their efficiency in transmission should be studied first. Investigation is also required on the part played by *Echidnophaga gallinacea*, Westw., and *C.* (*Malaraeus*) *telchinum*, Roths., in spreading the disease between domestic and wild rodents, as they occur on both. The latter is the more active and therefore probably the more important. The incidence of lesions in susceptible wild rodents is usually high in autumn, and their flea indices increase markedly at this time. The flea population of wild rodents is apparently more or less constant for each season, and a host freed of its fleas will very quickly acquire a normal infestation. Rodent poisoning does not increase the flea index on surviving animals and consequently does not increase the rate of infection. Wild rodents apparently acquire infection by ingesting infected fleas or rubbing infected fleas and rarely faeces into skin wounds, by the bites of fleas with contaminated mouth-parts, by the bites of infective, blocked fleas, and by eating one another. The part played by fleas in the transmission of plague from wild rodents to man is not understood. A number of cases of human infection have been traced to bites by captive, wild rodents.

EWING, H. E. & FOX, I. **The Fleas of North America. Classification, Identification, and Geographic Distribution of these Injurious and Disease-Spreading Insects.** *U.S. Dept. of Agric. Misc. Publ. No. 500.* 1943, Feb., 143 pp., 13 figs. [91 refs.]

The fleas of the United States have been carefully studied, partly at least because of the existence of sylvatic plague and murine typhus. But they have not been monographed since BAKER (1904), though the second author of the present paper revised the species known from the eastern United States in 1940.

The present paper deals with some 60 genera and 209 species.

The authors give a considerable amount of information which would be valuable to workers in other continents. There is a detailed account of the structure of head, thorax and terminal abdominal segments, and a full description of the anatomical characters of the Order Siphonaptera. The authors recognize six families (all occur in N. America), taking in this respect a rather conservative view: the key to families and subfamilies, and descriptions of these units will be generally useful. Genera are also diagnosed, but (rather unfortunately) species are not described nor are keys provided. It is therefore generally impossible to identify species from this monograph. Species are, however, listed, with data on synonymy, type host and locality, and range.

It is a matter of some interest to know that for many years *Xenopsylla cheopis* appeared to be confined to large ports. Since 1925, however, it has been found in a number of inland areas, including States so far north as Iowa and Minnesota ; it is now recorded from 19 States (six of them inland) and the District of Columbia.

P. A. Buxton.

GIRARD, G. Le comportement de la puce *Synopsyllus fonquernii* et son rôle dans la transmission de la peste. [**The Flea** *Synopsyllus fonquernii* **and its Rôle in Plague.**] *Bull. Soc. Path. Exot.* 1942, Apr. 22 & May 13, v. 35, Nos. 4–5, 177–81.

WAGNER and ROUBARD gave a description of the new flea *Synopsyllus fonquernii* in 1932 (*Bull. Soc. Path. Exot.*, v. 25, 327) from four examples only which had been found among a lot of 8,000 taken at Antananarivo from *Rattus rattus* var. *alexandrinus*. It was found again soon after in abundance as the sole flea on insectivorous hedgehogs, and since that time has multiplied considerably in Emyrne on the high plateau of Madagascar. This flea, unlike *X. cheopis*, flourished in the cold weather (May to October) on rats outside habitations and in their burrows. An index of this flea per rat can scarcely be set out ; its numbers are too small. Its number had therefore best be expressed as a percentage of *X. cheopis*, with which it is always associated. *Synopsyllus fonquernii* has been shown capable experimentally of infection by plague bacilli and of transmitting plague to guineapigs. Whether this flea bites man, is liable to be blocked like known vector fleas, and what are the meteorological factors influencing its vitality and infectivity, still remain to be worked out.

W. F. Harvey.

SHERRARD, G. C. **A Plan for Rodent Control in Cities.** *Pub. Health Rep.* Wash. 1943, May 28, v. 58, No. 22, 825–32. [14 refs.]

It would probably be admitted that rodent control is desirable in all cities, but it may not be so fully realized that " a rat campaign based upon a misconception of the factors involved may be termed a futile public health effort." A well considered plan, with provision for permanent control measures, is necessary. The author's description, in some detail, of such a plan will repay consultation. The headings of the scheme are as follows : (1) Trained leadership. (2) Office space and equipment. (3) Field equipment. (4) Records. (5) Survey of actual and potential harborages. (6) Trapping. (7) Identification and classification of rodents and their ectoparasites. (8) Rat-proofing ordinance. (9) Cooperation with other city departments and agencies. (10) Education and publicity. (11) Enforcement of provisions of ratproofing ordinance. (12) Permanent control measures. In the matter of training, The United States Public Health Service may be consulted. It is prepared to assist in planning a course of instruction, which should demand at least 90 days' training. One of the most essential recommendations in this plan is that the control procedures should be permanent. They are, in order of importance : (*a*) Ratproofing of all new buildings. (*b*) Ratproofing of infested buildings and fixtures with due attention to business investment interests. (*c*) Elimination of accumulations of waste material. (*d*) Neat and orderly storage of all goods and supplies to allow of complete visibility of rat

nesting places. (*e*) Trapping. (*f*) Fumigation followed by proper sanitary measures. (*g*) Poisoning. A good list of useful reference works is appended. *W. F. Harvey.*

CHOLERA.

WILKINSON, P. B. **Cholera in Hong-Kong.** *Lancet.* 1943, Aug. 7, 169–70.

Cholera had been absent for some years in Hong Kong when it broke out severely in 1937. The number of cases in 1938, 1939 and 1940 was 547, 708 and 647 with 363, 448 and 331 deaths respectively. Treatment was as follows. Axillary and rectal temperatures and blood pressures were taken; intravenous injections of normal saline, bicarbonate saline (gr. 160 per pint), or 2 per cent. glucose saline were begun at once. Hypertonic salt solution was not given as it had not proved demonstrably efficacious and might be the cause of acute toxaemia with indrawing of fluid from the intestine. The temperature of the injection fluid was "regulated by the difference between skin and rectal temperature—the greater the difference the lower the temperature of the saline." Rate of flow was governed by the degree of dehydration present. Two great dangers to life in cholera must be foreseen to be combated: hyperpyrexia during the reaction stage, and anuria. Treatment of anuria consisted in the "six-hourly infusion of 1,000–1,200 c.cm. of bicarbonate saline, the giving of hot rectal salines and cupping of the loins." Hyperpyrexia should be watched for during the infusion of saline and, if threatened, met by the application of ice packs or rectal injection of iced saline. If the rectal temperature, which should be taken every half hour, transgresses 106°F., death will ensue. Suppression of urine occurs when the systolic blood pressure drops below 70 mm. Hg.

As measures of control five points may be stressed: (1) Boil all drinking water. (2) Eat no uncooked food. (3) Be inoculated. (4) Avoid purgatives. (5) Diminish the fly nuisance. *W. F. Harvey.*

SADUSK, J. F., Jr. & OSWALD, Elizabeth. **Comparative *in vitro* Effect of the Various Sulfonamides on *V. cholerae*.** *Amer. J. Trop. Med.* 1943, Mar., v. 23, No. 2, 275–9, 1 fig. [11 refs.]

In vitro experiments with antibacterial reagents have usually been carried out so as to differentiate between bacteriostatic and bactericidal effect. Attention must also be paid, however, to the fact that component substances in the nutrient medium itself may inhibit the action of the test reagent. Such inhibiting substances in the media used may have vitiated some of the work already done on sulphonamides. In the present investigation care has been taken to use a synthetic medium which is free from this defect. It is an asparagin-ammonium-sulphate-glucose medium and the test sulphonamide was dissolved in it to yield a series of concentrations ranging from 0·1 up to 200 mgm. per 100 cc. Two measures of activity were determined: (1) the *bacteriostatic concentration*, the lowest concentration which inhibited growth, and (2) the *bactericidal concentration* or the concentration which did not permit growth on reincubation of tubes after the

action of the sulphonamide had been abolished by the addition to each tube of 0·1 cc. of a 100 mgm. per 100 cc. solution of para-amino benzoic acid. The result of this testing showed the great superiority, in the case of *V. cholerae*, of sulphathiazole, bacteriostatic at 0·1 mgm. per 100 cc. over sulphadiazine, sulphaguanidine and sulphanilamide, in that order. It is unfortunate that sulphathiazole may be too readily absorbed from the intestine to be effective therapeutically: sulphaguanidine may be preferable, as concentrations of over 200 mgm. per 100 cc. in the stools may be readily attained with it.

W. F. Harvey.

BACILLARY DYSENTERY.

SAVAGE, T. R. **The Treatment of Acute Bacillary Dysentery with Sulphapyridine. A Possible Emergency Substitute for Sulfaguanidine.** *J. Roy. Army Med. Corps.* 1943, May, v. 80, No. 5, 275–8.

The author reports favourably on sulphapyridine in the treatment of bacillary dysentery and advocates its use if the drug of choice, sulphaguanidine, is not available. He records 13 cases, in 11 of which the organism was identified. The doses advised are 2 gm. initially, followed by 1 gm. every four hours; a total of 15 gm. was enough for all patients except one who had a mixed infection with Shiga and Flexner organisms. The number of stools was reduced to three a day usually within 48 or 72 hours, and fever, tenderness and colic disappeared even more quickly. Morphine was useful in the early stages but intravenous salines were not needed.

Sulphapyridine produced the usual depression, and nausea occurred in some cases; one patient developed an erythematous rash. The drug was most successful in Flexner infections, but the author considers that it should be used for the Shiga type if sulphaguanidine is not at hand.

C. W.

SWYER, R. **Sonne Dysentery. Sulphapyridine in its Treatment.** *Lancet.* 1943, July 17, 71–2.

Any procedure which curtails the illness caused by Sonne dysentery and reduces the number of carriers is important. The present series comprised 92 cases of Sonne dysentery, 57 of which were treated with sulphapyridine and 35 were used as controls.

As far as possible daily bacteriological examinations of faeces and rectal swabs on desoxycholate-citrate agar were carried out in the sulphapyridine series and twice weekly in the controls.

Treatment with sulphapyridine by mouth was instituted immediately on isolation of *Bact. dysenteriae*, Sonne, and was continued until negative faecal and rectal swab cultures were obtained. Forty-eight hours after cessation of treatment further bacteriological examinations were carried out; when negative, these were repeated until a minimum of three consecutive negative faeces and rectal swabs had been obtained. If positive, the routine course of treatment was repeated. There was little toxaemia or dehydration in either group. Blood was passed in the faeces for an average of three days by 29 of

the patients, but nearly all passed mucus. In the sulphapyridine series the stools rapidly became normal in appearance, while in the controls improvement began much later. Bacteriological relapses occurred in three of the cases that were treated with sulphapyridine, but only within the first 2-3 days after stopping the treatment, while in the controls changes from negative to positive took place in six instances at later periods (7–36 days); thus some patients became convalescent carriers. Numerous total and differential white cell counts were made but no blood changes of any real significance were encountered.

Particularly significant has been the great reduction in time required for both clinical and bacteriological cures—particularly in the lower age groups—and the complete absence of convalescent carriers in the chemotherapy series. *P. Manson-Bahr.*

COMPTON, A. **Comparative Value of Phage and Sulphonamides in Acute Bacillary Dysentery.** [Correspondence.] *Brit. Med. J.* 1943, Aug. 7, 178–9.

The author compares the published results obtained in the treatment of bacillary dysentery by FAIRLEY and BOYD [*Brit. Med. J.*, 1942, Dec. 5, 673] with sulphaguanidine, by REITLER and MARBERG [this *Bulletin*, 1941, v. 38, 280] with sulphapyridine, and by himself [this *Bulletin*, 1930, v. 27, 396] with antidysentery bacteriophage. He says that attacks of bacillary dysentery have become matters of little concern in Alexandria owing to the efficacy of phage treatment and " few practitioners with any genuine experience of good phage preparations will, I think, want to change their accustomed line of treatment with phage for sulphonamides unless it be in the occasional chronic case that may not respond straightway to phage." He urges the use of bacteriophage in the Services, since unlimited supplies could be made available. [See also this *Bulletin*, 1942, v. 39, 36.]

J. F. Corson.

YAWS AND SYPHILIS.

BRICEÑO ROSSI, A. L. El valor del *Verifications Test*, en la serologia del carate o mal del pinto y buba (pian o yaw). [**The " Verifications Test " in Pinta and Yaws.**] *Rev. Sanidad y Asistencia Social.* Caracas. 1943, Feb., v. 8, No. 1, 153–65. [10 refs.]

The Verifications Test is designed to exclude or differentiate non-specific reactions in the Kahn test for syphilis and is, therefore, of particular value when the clinical and serological findings are at variance. The test consists in noting the effects of temperature on the Kahn standard test, the temperatures chosen being 37° and 1°C. True syphilitic sera flocculate at the higher temperature but not at the lower; with non-syphilitic sera the reverse obtains. In other words morbid conditions giving false positives would be reported as " Negative at 37°C., positive at 1°C."

In the present study the author carried out the test on 311 human and 10 animal sera. The former included: healthy persons 61, sera from venereal dispensaries 155, cases of pinta 37, of yaws 18, of leprosy

30, and 10 from the tuberculosis dispensary. The animals included dogs, rabbits, horses, sheep and guineapigs. One or two of the results may be given: of the 30 leper sera 19 were negative to the Kahn standard at both temperatures, four were positive to both; three of those Kahn positive were so at 37° but negative at 1°C., and four others the reverse of this. Thirteen syphilitic sera were positive to the standard Kahn at 37°, negative or weakly positive at 1°C. Of the 37 pinta sera 23 positive to the standard Kahn were so at 37°, but negative or weakly positive at 1°; one with 4 plus standard gave 2 plus at 37° and 1 plus at 1°C.; three were positive at both temperatures. Fourteen yaws sera were positive at 37°, negative or weakly positive at the lower temperature.

In brief, of the total 321 sera 303 gave the same results in the standard as in the two temperature tests; the 18 which did not were either animal sera or sera from cases of leprosy or malaria. That is to say that sera of syphilitics, of pinta and of yaws patients proved specific by the Verifications Test. The results are presented in a series of tables. [The test does not, therefore, help in any way to distinguish serologically between these three spirochaetal diseases.]

H. Harold Scott.

MONTEL, R. La syphilis dite exotique chez les Annamites de Cochinchine. [**The So-called Exotic Syphilis in Annamites of Cochin China.**] *Bull. Soc. Path. Exot.* 1942, Apr. 22 & May 13, v. 35, Nos. 4–5, 132–47. [82 refs.]

This is a critical review of the literature on the old questions of the resistance, to the invasion of *Sp. pallida*, of the parenchyma of the central nervous system in other than white races; and of the existence of neuro-tropic and dermato-tropic strains of the organism.

The author reviews the old arguments that the natives of Indo-China, like those of North Africa, suffer severely in their skin and skeletal structures but not in respect of tabes and general paresis, because of some special strain of *Sp. pallida*. He points out that the severe effects of syphilis on the skin, etc., of natives of Cochin China are only the result of additional trauma to which these structures are exposed there, to malnutrition, to indifferent hygiene, to neglect of treatment and so forth; such conditions largely prevailed in Europe in past centuries, and the external manifestations of syphilis were correspondingly violent.

He shows by quotation from articles by many writers that the natives of Cochin China do suffer from tabes and general paresis, and the apparent absence, or scarcity, of these effects of syphilis in the past was due only to lack of skilled observation. Tabetics were overlooked until the ophthalmologists and the neurologists began to examine the native sick in closer detail, and the general paretics were usually hidden by their relatives.

Against the view often advanced that the greater frequency with which parenchymatous neuro-syphilis is seen to-day in these parts is due to the introduction of arsenical treatment, the author points out that a large proportion of these patients had not received any treatment whatever.

He cites similar observations in China and North Africa and concludes that there is only one syphilis, and its effects are largely conditioned by the circumstances rather than the make-up of its victims.

He regards race and climate as negligible factors, if they exist as factors at all. He seems to leave open the question whether neurosyphilis is proportionally to the infected as prevalent in Cochin China as in Europe; that will be decided by further observation.

L. W. Harrison.

LEPROSY.

FAGET, G. H. **Control of Tuberculosis in a Leprosarium.** *Amer. Rev. Tuberculosis.* 1943, June, v. 47, No. 6, 603–7.

This paper deals with the difficult subject of the frequent tuberculosis complications among leprosy patients at Carville, U.S.A. Data are quoted to show the proportion of deaths due to complicating pulmonary tuberculosis among lepers in various countries: they found from 24 to 32 per cent. of deaths at the Culion Leper Colony and 18 per cent. at the U.S.A. leprosarium in Louisiana. In controlling this loss the most important step is the early diagnosis of the lung complication by means of X-rays and the isolation of these patients to prevent their spreading the infection to others. Finding acid-fast bacilli in the sputum is not diagnostic, as they may come from throat or air-tube infections with lepra bacilli, so inoculation into animals or cultivation of the tubercle bacillus is also necessary. Leprotic lesions of the lung tissue are very rare and are too small to be seen by X-rays. At Carville, radiographs are taken of the lungs of all patients on admission, and the fact that in that well-financed institution each patient has a separate room further diminishes the chances of the occurrence of tuberculosis infections. When that complicating disease is found, all active anti-leprosy treatment is stopped and artificial pneumothorax and other remedial measures used, with as good results as in uncomplicated phthisis. Among 32 patients studied for ½ to 2½ years at Carville, 10 with advanced disease had died, and two others are doing fairly well: in several with slightly or moderately advanced disease the lesions have become quiescent. The prognosis, therefore, as far as tuberculosis is concerned, is fairly good. *L. Rogers.*

HELMINTHIASIS.

CHIN, T. H. & LI, K. C. **A Survey of the Metazoan Parasites of the Domestic Cat, *Felis domestica*, of Kweiyang.** *Chinese Med. J.* 1942, Oct., v. 61A, No. 1 (Chengtu Edition, v. 1, No. 1), 30–36.*

"1. A survey of 120 domestic cats, *Felis domestica*, for metazoan parasites was conducted in Kweiyang. Only one of the animals was found free from parasites.

"2. Sixty per cent. of the cats were found infested with one or more species of ectoparasites; four species of fleas, *Ctenocephalides felis felis*,

*This is the first issue of the *Chinese Medical Journal* to be published in Chengtu. The editors are to be congratulated, and readers throughout the civilized world will be glad to know that this fine journal continues despite the war.—*Ed.*

Xenopsylla cheopis, *Monopsyllus anisus* and *Pulex irritans*, and one species of louse *Trichodectes* sp.

"3. More than ninety per cent. (97·5) of the animals were infected with helminths, and 59·83 per cent. were infected with trematodes, *i.e.*, *Pharyngostomum cordatum*, *Paragonimus*, *Fasciola hepatica*, and *Eurytrema* sp., with a negative finding for *Clonorchis sinensis*.

"4. Some four species of cestodes were recovered from 87·50 per cent. of our cats: they were *Diphyllobothrium spargana*, *Taenia taeniaeformis* and *Dipylidium caninum*.

"5. Nine species of nematodes, namely, *Toxocara mystax*, *Ancylostoma braziliense*, *A. caninum*, *Uncinaria* sp., *Thelazia callipaeda*, *Oliganchonema praeputiale*, *Cyclicospirura* sp., *Dirofilaria immitis* and *Capillaria* sp., were found in 85 per cent. of the animals examined.

"6. The following parasites are reported for the first time in the cat in this country: *Xenopsylla cheopis*, *Monopsyllus anisus*, *Trichodectes* sp., *Fasciola hepatica*, *Eurytrema* sp. and *Uncinaria* sp. *Eurytrema* is probably also reported for the first time from the cat."

[See also this *Bulletin*, 1942, v. 39, 627.]

POIRIER, M. & BLONDEL, P. Sur deux tumeurs observées chez des Sénégalais, l'une vésicale due à *Schistosoma haematobium* et l'autre iliaque due à *Onchocerca volvulus*. [**On Two Tumours observed in Senegalese, one Vesical due to *Schistosoma haematobium* and the other Iliac due to *Onchocerca volvulus***.] *Bull. Soc. Path. Exot.* 1942, Apr. 22 & May 13, v. 35, Nos. 4–5, 161–2, 4 figs. on 2 pls.

The first patient entered hospital with haematuria at the end of micturition. Numerous erythrocytes and epithelial cells were found in the urine, but no eggs of Schistosoma. Cystoscopy revealed multiple haemorrhagic tumours at the level of the apex of the bladder and on its anterior wall; subsequent operation showed that some were sessile and some stalked; all were friable and about the size of peas. The blood count showed 9 per cent. of eosinophils. In sections of the tissue removed there were very numerous eggs of *Schistosoma haematobium*, a marked local eosinophilia, sclerosis and thrombophlebitis.

The second patient had a painless swelling, about the size of a pigeon's egg on the left hip, one cm. below the iliac crest; it was circumscribed, mobile, not adherent to the skin, and firm. There were 26 per cent. of eosinophils in the blood. A tumour the size of a nut was removed; it had multiple cavities containing parts of male and female nematodes; the uteri of the females contained numerous "embryos" and many microfilariae were free in the connective tissue; these were identified as those of *Onchocerca volvulus*. — *G. Lapage.*

MARTÍN SÁNCHEZ, A. Sobre un caso autóctono de bilharziosis vesical observado en la isla de La Palma (Canarias). [**On an Indigenous Case of Vesical Bilharziasis observed in Las Palmas (Canary Islands)**.] *Rev. Clin. Española*, 1943, Feb. 15, v. 8, No. 3, 196–9.

The author describes what he regards as the first case of vesical bilharziasis to be recorded in the Canary Islands.

The patient was a native of Tegueste, Teneriffe, aged 23. He had always lived in Teneriffe until he came to the island of Las Palmas a few months before he was seen. He had been healthy until, 15 days

before he was examined, he had dysuria and ultimately haematuria. General examination failed to reveal anything of interest. The erythrocyte count and haemoglobin were normal, but there were 9·5 per cent. of eosinophils. Cystoscopy showed that all the vesical mucosa was hyperaemic and in some areas there were groups of eggs of *Schistosoma haematobium*. These eggs were found in the urinary sediment. The patient was treated with intravenous cylotropin and intramuscular fouadin. After the fourth injection of fouadin "a few small worms" (unos pequenos gusaños) were expelled by the urethra. A month after commencement of the treatment blood and eggs of Schistosoma had disappeared from the urine and the patient was considered cured. He fought in the Spanish war and has remained well since.

The rest of the paper discusses bilharziasis and the cases previously recorded in Spain and Portugal. The high incidence of helminthiasis and protozoal infestations in the Canary Islands is discussed. The author considers that 80 per cent. of the children of the poorer classes and the rural population are infested with helminths (Ascaris, Trichuris, Enterobius and other species). *G. Lapage.*

Lutteрmoser, G. W. Destrucción de caracoles transmisores de *Schistosoma mansoni* en Venezuela. [**Destruction of Snails transmitting *Schistosoma mansoni* in Venezuela.**] *Rev. Sanidad y Asistencia Social.* Caracas. 1943, Feb., v. 8, No. 1, 3-44, 4 figs. [35 refs.]

This is Part II of a report on the author's work, Part I, of which was published in the *Rev. Sanidad y Asistencia Social*, v. 6, No. 6, 874–897 [not received at this Bureau]. The author here records his work on the biology of the snail *Australorbis glabratus* (*Planorbis guadeloupensis*) [*cf.* Brumpt, this *Bulletin*, 1942, v. 39, 866, who concludes that the correct name of this snail is *Planorbis* (*Australorbis*) *glabratus*], the vector of *S. mansoni* in Venezuela and also his successful control of the snails by means of recently slaked lime applied to the waterways.

Methods of cultivating the snails in the laboratory are described. The snails began to lay eggs when they were 3-6 months old, the number laid by each snail varying from 6 to 391 per month. The snails live for 1–1½ years. Some were still alive after 2 months in the laboratory in a box of dry earth. Drying of the canals is of doubtful value in Venezuela, because some water always remains in them. Reconstruction of the waterways could remedy this, but it is probable that many canals will be removed in the future and it is useless to improve the canals when the rivers are also infested by snails. Control of the vegetation of the river banks would render the breeding of the snails more difficult, but treatment of the water is more sensible and more effective. Laboratory experiments are described which indicate that the snails are killed by a 0·1 per cent. solution of recently slaked lime within a day or less, and their eggs are also killed in this solution, although they can develop in concentrations less than this. The cercariae of *S. mansoni* are killed in 15–60 minutes by a 0·05 per cent. solution of lime; in a 0·025 per cent. solution they are all dead in 3–5 hours. Solutions of the various components of the lime solution were also tried. The results indicated that calcium chloride, calcium sulphate, sodium chloride and sodium bicarbonate did not kill the snails; the author supposes that the hydroxides of calcium, sodium

and magnesium were the lethal agents. Sections of snails killed in the lime indicated that the cause of death was damage to epithelia of the snails and consequent haemorrhage, but lack of published work on the histology of this snail made it difficult to determine the exact cause of death.

Treatment of waterways with lime was tried in 1 kilometre of a canal in the suburb of El Cementerio, Caracas ; in a section of a canal near Antímano ; in a cement tank, and in 500 metres of the river El Valle. The methods of distributing the lime (by hand, or by emptying sacks into the canal or spreading it over the banks, or both) and the traps used to prevent snails from entering treated waters, are described. Several lime treatments kept the waters used for experiment practically free of snails for six months. Usually one lime treatment every three months was enough and it killed also the eggs of the snails and the cercariae ; it also reduced considerably the bacterial content of the waters. The cost is given ; it is not considered high, especially when the danger of schistosomiasis is considered ; it depends on the number of snails, the physical nature of the site and the possibility of preventing the entry of snails into the waters treated. Lime is cheap and easily obtained ; it is bactericidal and neutralizes the acid soils prevalent in the endemic area ; the method of using it is simple and effective. The author recommends that tanks and canals should be dried completely for three consecutive months ; this can be done only in the dry season. Canals should be improved so that water does not persist in them when they should be dry. Vegetation should be removed and other measures taken to prevent the breeding of snails. Destruction of the snails is, however, only a part of the general problem, for the solution of which co-operation of the public, the Government, the sanitary workers and the teachers is required. *G. Lapage.*

Neumann, Meta A. **Cysticercus Cellulosae of the Brain : Report of a Case.** *J. Neuropath. & Exper. Neurol.* 1943, Apr., v. 2, No. 2, 197–202, 4 figs. [11 refs.]

Wolfe, H. R. I. **Hydatid Disease in Wales.** *Lancet.* 1943, June 26, 795–9, 6 figs.

The author quotes figures taken from the Registrar General's returns in support of his opinion that hydatid disease is commoner in Wales than elsewhere in Great Britain. Deaths attributed to this disease per head of the population were 1 : 72,000 in Wales, 1 : 372,000 in England and 1 : 2,483,000 in Scotland. A comparison of the numbers of cases treated for hydatid disease in five hospitals in South Wales and in three London hospitals indicates the same conclusion.

In 34 cases treated at the Cardiff Royal Infirmary between 1926 and 1938 the age of the patients at the time of admission to hospital was between 2½ and 68 years. The age of the patient was no criterion of the age of the infestation, the latter being usually long-standing. The age of the infestation is indicated by the presence or absence of multi-vesiculation, sterility, calcification or complications of the cysts. Infestation is probably acquired in childhood or in early adult life, chiefly from dogs, by handling their infected muzzles or by their contamination of gardens, etc. Direct contamination is probably the commoner method of infestation. Inefficient supervision of slaughter houses in some districts helps to spread infestation in dogs.

Infested persons may lead a comparatively normal life for years and the degree of incapacity caused is slight. Primary cysts in the lung and liver attain a large size before they cause symptoms ; brain cysts are rare. The symptoms and various methods of treatment are discussed. Injection of a 1–2 per cent. aqueous solution of formalin should be a routine procedure. Just over half the author's 34 cases were diagnosed before operation. Sixteen patients died, so that mortality was high, especially in patients over 40. Operations were done on 27 of the cases and these are described. *G. Lapage.*

Larsh, J. E., Jr. **Serological Studies on the Mouse Strain of the Dwarf Tapeworm, *Hymenolepis nana* var. *fraterna*.** *Amer. J. Hyg.* 1943, May, v. 37, No. 3, 289–93.

"White mice infected with the dwarf tapeworm, *Hymenolepis nana* var. *fraterna*, were shown to have elaborated specific agglutinating, precipitating, and complement-fixing antibodies. The latter were also demonstrated in two rabbits that had received repeated injections of the worm antigen. In addition, a report is given of tests performed which indicate the absence in this cestode of Forssman's heterogenetic antigen."

Mazzotti, L. & Osorio, M. Teresa. Cinco nuevos casos de infección humana por *Hymenolepis diminuta* en Mexico. [**Five New Cases of *H. diminuta* Infection in Mexico.**] *Rev. Inst. Salubridad y Enfermedades Trop.* Mexico. 1943, Mar., v. 4, No. 1, 49–52. English summary (2 lines).

Chang, K., Tong, W. K., Li, C. H. & Chin, H. T. **The Epidemiology and Importance of Hookworm Disease in Szechwan Province.** *Chinese Med. J.* 1942, Oct., v. 61A, No. 1 (Chengtu Edition, v. 1, No. 1), 1–8.

"1. On account of extraordinarily favorable climatic conditions and certain agricultural practices hookworm infection and disease have been found to be very widespread in Szechwan, which is one of the largest, richest, and most densely populated provinces of China.

"2. Severe hookworm disease, which constitutes an important public health problem, has been found over a large section in North Szechwan and in certain areas in East and South Szechwan.

"3. In striking contrast to the situation in the sericulture centers in east China, investigated by Cort *et al.* of the China Hookworm Commission, no association between mulberry cultivation and hookworm disease in the mulberry areas of this part of China has been found.

"4. In full agreement with the conclusion reached by the China Hookworm Commission our epidemiological studies have proved that cultivation of rice in Szechwan produces conditions unfavourable for hookworm transmission.

"5. Epidemiological studies have indicated that cultivation of sugar cane and citrus trees in the province do not seem to be important sources of hookworm disease.

"6. General 'dry land cultivation' of miscellaneous crops in the hilly sections of the province probably produces conditions rather favorable for hookworm propagation.

"7. A specific association of corn-sweet potato cultivation and hookworm disease previously unknown in China or elsewhere has

been discovered in Szechwan. The procedure of corn-sweet potato intercropping produces remarkably ideal conditions for the dissemination of hookworm."

COURTNEY, A. D. **Unusual Case of Obstruction by Worms.** [Memoranda.] *Brit. Med. J.* 1943, June 12, 725–6.

The patient was a child aged five, in County Tipperary, who had an attack of abdominal pain and vomiting, without rise of temperature and without abdominal rigidity; restlessness was the most pronounced feature. Under anaesthesia a mass, suggesting intussusception, could be felt below and to the right of the umbilicus, and on opening the abdomen this was found to be obstructed intestine. On incision of the bowel wall several roundworms [presumably *Ascaris lumbricoides*] presented, and 66 were removed; the obstruction was thus relieved. Recovery was good, and a week later a course of five 2-grain santonin powders, at two-day intervals, was commenced. This treatment brought away 13 more worms. [See this *Bulletin*, 1924, v. 21, 957; 1928, v. 25, 961; 1929, v. 26, 550; 1934, v. 31, 793; 1936, v. 33, 108; 1938, v. 35, 670; 1939, v. 36, 321, 723; 1940, v. 37, 298, 480.] *C. W.*

STEFANOPOULO, G. Prurigo filarien ou *gale filarienne* dans un cas de filariose à Loa. [**Filarial prurigo or "Gale filarienne" in a Case of Filariasis due to** *Loa loa*.] *Bull. Soc. Path. Exot.* 1942, Apr. 22 & May 13, v. 35, Nos. 4–5, 157–61, 2 figs.

"Gale filarienne" is not always due to infestation with *Onchocerca volvulus*. The author describes two cases due to infestation with *Loa loa*. The first was in a boy of 18 who began to show the characteristic Calabar swellings after his return from Sierra Leone, but the main symptom was very marked pruritus with prurigo. There was enlargement of the glands, especially of those in the left groin. Biopsy of these glands did not reveal any microfilariae. There was an eosinophilia of 20–44 per cent. No microfilariae were found in the blood, but the complement fixation reaction for filariasis was positive. No trace of onchocerciasis was found.

The second patient, a woman aged 32, acquired *L. loa* infection in Gabon in 1934–7. She had typical oedema and itching at night. The eosinophilia was 65 per cent. No microfilariae were found in the blood, but complement fixation and intradermal reactions were positive. Antimony treatment resulted in some improvement of the pruritus. The author emphasizes the help obtained from the complement fixation and intradermal reactions, especially in the diagnosis of *L. loa* infection, which can show such various clinical aspects. He does not state what antigen was used. *G. Lapage.*

WELLER, T. H. **The Development of the Larvae of *Trichinella spiralis* in Roller Tube Tissue Cultures.** *Amer. J. Path.* 1943, May, v. 19, No. 3, 503–15, 8 figs. on 2 pls. & 1 text fig. [14 refs.]

After discussing earlier attempts to cultivate larvae of *Trichinella spiralis* and other nematodes in sterile media, the author describes his roller tube tissue cultures, which consist of chick embryo fragments planted in chick plasma clot distributed evenly over the walls of test tubes to which a nutrient medium was added. Into these 50–300

larvae of Trichinella per tube were placed and their development was observed with a microscope, some larvae being removed for examination whenever the nutrient medium was being renewed, *i.e.* daily. The larvae, obtained by peptic digestion from infested rats, were sterilized by repeated washing in normal saline, this method being adopted because it was found that the antiseptics tried (quinanil, merthiolate and hypochlorites) were toxic to the larvae.

Partial development of the larvae occurred in the cultures and a small percentage moulted twice. Some attained a degree of sexual differentiation (anal papillae in the male and formation of the vulva, ovary and uterus in the female) ; but the larvae decreased rather than increased in size, died off progressively, and often were unable to cast their skins, so that larvae still enclosed in 1–3 uncast sheaths were seen. The first moult was completed by 10–20 per cent. of all larvae ; the second moult was seen only twice ; the incomplete sexual differentiation seen occurred only in larvae which lay inside one or more uncast skins. The occurrence of larvae inside three uncast skins suggests that earlier workers are right in stating that there are normally four moults, but one or more of the incomplete ecdyses seen may have been responses to the abnormal environment.

The addition of sterile sand to the medium in an attempt to favour ecdyses and of yeast or liver extracts, vitamins and other substances failed to improve the medium. The growth of the chick embryonic tissue was not affected by the presence of the larvae. *G. Lapage.*

Reimann, H. A., Price, Alison H. & Herbut, P. A. **Trichinosis and Periarteritis Nodosa : Differential Diagnosis ; Possible Relationship.** *J. Amer. Med. Ass.* 1943, May 29, v. 122, No. 5, 274–9, 7 figs. [Refs. in footnotes.]

"The 2 cases presented were regarded clinically as trichinosis, yet the typical lesions of periarteritis nodosa were present in tissue examined during life. Both patients had chronic nephritis. One died, and at necropsy no evidence of periarteritis nodosa remained, but trichinellae were found in the muscles. There is a possibility that trichinosis as a disease with strong allergic manifestations may in certain instances serve as one cause of the syndrome called periarteritis nodosa."

Nagel, A. Ueber spezifische und unspezifische serologische Befunde bei der Trichinose des Menschen. [**On certain Specific and Non-Specific Serological Results in Trichiniasis of Man.**] *Ztschr. f. Immunitätsf. u. Experim. Therap.* 1943, Feb. 12, v. 102, No. 6, 424–32.

This paper is reviewed in *Bulletin of Hygiene*, 1943, v. 18, p. 640.

Martinic, A. Estudio sobre triquinosis en Santiago, con especial referencia a su importancia clínica y epidemiológica y a la intradermo reacción diagnóstica de Bachman. [**Trichiniasis in Santiago (Chile) ; its Clinical and Epidemiological Importance ; Bachman's Reaction in Diagnosis.**] *Rev. Chilena de Hig. y Med. Preventiva.* 1942, Sept., v. 5, No. 2, 131–66, 7 figs. (6 on 3 pls.). [43 refs.] English summary.

This paper is reviewed in *Bulletin of Hygiene*, 1943, v. 18, p. 641.

WRIGHT, W. H. & BOZICEVICH, J. **Experiments in the Cooking of Garbage for the Destruction of Trichinae in Pork Scraps.** *Pub. Health Rep.* Wash. 1943, Mar. 5, v. 58, No. 10, 396–404.

This paper is reviewed in *Bulletin of Hygiene*, 1943, v. 18, p. 641.

DEFICIENCY DISEASES.

CEYLON: SOCIETY OF MEDICAL OFFICERS OF HEALTH [WICKREMESINGHE, W. G., Chairman]. **Nutrition in Ceylon: its Bearing on National Health and Well-being, 1942.** 12 pp., 2 charts & 4 figs. Colombo: Ceylon Daily News, Lake House, McCallum Road.

This memorandum was prepared by a Committee of the Society of Medical Officers of Health. The poor physique of the Ceylonese is attributed to dietary deficiency rather than to racial factors. Many children show retarded development and vitamin deficiencies; a survey of school-children in 1934–36 showed that 7·7 per cent. suffered from sore mouth (a sign of riboflavin deficiency) and 29·2 per cent. had phrynodermia, a skin eruption due to vitamin A deficiency. Keratomalacia causes about two-thirds of the many cases of blindness among infants and young children. The infant mortality rate is nearly three times that of England and Wales. A dietary survey among the rural population showed that 39 per cent. of the families surveyed received less than 2,000 calories per adult unit per day, the chief deficiency being in protein and calcium.

The Committee recommends that measures be taken to enable a family requiring four adult food units per day to receive an adequate income, that more fish and milk should be available, a midday meal be provided for children and a pint of milk daily for nursing mothers and infants where necessary. *J. F. Corson.*

FERRO-LUZZI, G. L'avitaminosi "A" in Eritrea. Nota I. Tecnica di dosaggio e valori in soggetti normali. [**Avitaminosis A in Eritrea. I. Technique employed and the Amount in (the Serum of) Normal Subjects.**] *Boll. d. Soc. Italiana di Med. e Igiene Trop.* (Sez. Eritrea.) Asmara. 1942, v. 1, No. 4, 79–84.

Both Europeans and natives in Eritrea are often found presenting obvious or latent indications of deficiency of vitamin A. In this article the author describes his method of estimation and the results obtained in persons apparently normal, Europeans and natives. He uses a modification of the method of Carr and Price. To 10 cc. of serum is added an equal quantity of 95° alcohol. After centrifugation, 15 cc. of boiling petroleum ether is added to the supernatant fluid. The alcohol is poured off after the mixture has been shaken. The petroleum ether containing the vitamin A is distilled to dryness in a current of CO_2 or nitrogen. The dried residue is taken up with 2 cc. of pure chloroform and evaporated in a current of CO_2. This is repeated twice

and the dried residue, now free from petroleum ether is again taken up with 2 cc. chloroform and 1 cc. of the Carr Price reagent is added and read off against the control. His method avoids saponification of the carotinoid pigment.

The amount in I.U. per 100 cc. has been reported as being within wide limits. Wolff regarded 30–80 as normal, Lindqvist 200–400, and this was confirmed by Rubegni, Dost gave it as 220, Schneider as about 100 units.

The author has studied the figure in 27 Europeans and the same number of natives, regarded as healthy. Among the former, whose ages ranged between 22 and 75 years, the number of units per 100 cc. varied from 27 to 84, with an average of 47·7. Among the natives aged 16 to 40 years, the amount ranged from a trace to 48, with an average of 22·4 per cent. In other words the subjects tested were in a subclinical state of vitamin A deficiency. *H. Harold Scott.*

Ferro-Luzzi, G. L'avitaminosi " A " in Eritrea. Nota 2. Comportamento della vitamina "A", nel dermotifo. [**Avitaminosis A in Eritrea. II. Vitamin A in Typhus.**] *Boll. d. Soc. Italiana di Med. e Igiene Trop.* (Sez. Eritrea.) Asmara. 1942, v. 1, No. 4, 85–8.

This study was undertaken to estimate the importance of vitamin A in infective diseases, by determining first whether the blood content of this vitamin undergoes change in the course of the disease or during convalescence, and, second, if the administration of large doses of the vitamin would modify the content in the blood and affect the clinical course of the disease. The results are presented in a table, detailing 19 natives and 12 Europeans, the estimations being made at the height of the fever, and on the 1st, 6th and 10th days of apyrexia. At the height of the fever there was none of the vitamin, or at most only a trace, present in the blood. On the first day of normal temperature (13th–16th day of the disease) in three cases the amount was 18 I.U. per cent., in 14 an inestimable trace, in 10 it was absent. On the sixth day of apyrexia, it was present as a trace in six, in the others 15–40 units per cent. On the tenth day, all but two had regained what the author found to be the normal amount, 21–60 I.U. per cent. Finally, he found no benefit from administering the vitamin in the course of the fever. *H. Harold Scott.*

Ferro-Luzzi, G. L'avitaminosi "A" in Eritrea. Nota 3. Rapporto tra livello ematico di vitamina "A" e fenomeni clinici di carenza. [**Avitaminosis A in Eritrea. III. Relation between the Blood-Content of Vitamin A and Clinical Signs of Deficiency.**] *Boll. d. Soc. Italiana di Med. e Igiene Trop.* (Sez. Eritrea.) Asmara. 1942, v. 1, No. 4, 89–91.

Two hundred native prisoners, 16–30 years of age, of good general constitution but showing signs of food deficiency, were examined in accordance with the technique described above. Thirty-four showed a definite deficiency of vitamin A—absence or a mere trace. Thirty-two showed follicular keratosis affecting the trunk, the anterior surface of the thighs and the elbows, as dry white areas, " ash-bark skin," or as acuminate papules, " toad skin." Hemeralopia was found in ten, and,

of these, nine had the cutaneous manifestations also. None of the 34 showed any xerophthalmia. *H. Harold Scott.*

TASSI, G. L'avitaminosi "A" in Eritrea. Nota 4. Studio sull' emarolopia. [**Avitaminosis A in Eritrea. IV. Hemeralopia.**] *Boll. d. Soc. Italiana di Med. e Igiene Trop.* (Sez. Eritrea.) Asmara. 1942, v. 1, No. 4, 92–4.

Medical men in general and eye-specialists in particular, have remarked on the rarity of cases of hemeralopia in Eritrea. It seems to be endemic in the Dahlac archipelago and among the inmates of the local penitentiary. "It is noteworthy" writes the author, "that hemeralopia has appeared especially in scorbutic subjects, which makes one doubt the general idea that vitamins A and C are antagonistic." [It is difficult to see how this applies to the case in point. Both might be low in such patients.]

The vitamin A content was studied in six hemeralopics from the Nocra penitentiary and six hemeralopics and scorbutics from that of Adi Quala. Not a trace was found in any of them, but a diet containing the vitamin A restored the blood-content to normal and the hemeralopia gradually disappeared. *H. Harold Scott.*

CHARTERS, A. D. **Epidemic of Beriberi amongst Somali Troops in East Africa Command.** *Trans. Roy. Soc. Trop. Med. & Hyg.* 1943, July, v. 37, No. 1, 55–62. [13 refs.]

In February 1942, at a medical inspection of the Somali Frontier Guards, nine soldiers were observed to be suffering with anasarca, dyspnoea, tachycardia and patchy anaesthesia. Four of them had enlarged hearts, distended veins in the neck and epigastric pulsation. Anaesthesia involved mainly the legs and there was hyperaesthesia of the calf and thigh muscles. It was ascertained that other Somalis on the same diet as these, but stationed some miles distant, were suffering in a similar way. Altogether 18 cases are referred to. In short, the signs were typical of beriberi, wet in some cases, dry in others. Those most severely affected were taken into hospital and given injections of betaxin (10 mgm.). The others had their diet supplemented by maize meal, ¼ lb. daily, and later ground nuts with beans.

Twelve days later two of the patients who, by reason of poor appetite, had not taken the full amount of food, still showed signs of neuritis, but all the others had recovered.

The regular daily diet before the outbreak consisted of: Rice 1 lb., meat ½ lb., ghee 2 oz., dates ½ lb., sugar 2 oz., tea ½ oz., salt ½ oz. This had been the diet for six months (but meat for four months only). The author gives the results of analyses of these foods and shows that such a diet contains only 244 I.U. of vitamin B_1 instead of the necessary 360 or so. It is also deficient in calcium, vitamins A and D, and riboflavin and ascorbic acid. Beriberi as a rule takes three months to develop; consequently other Somalis who had been on this diet for only two months, had up to the time of the inspection, shown no symptoms. That the Somalis do not suffer from the disease in civil life is ascribed to the fact that they also have milk (cow's or camel's) and jouari, a form of millet, and at times eggs and whole-meal bread. An instructive table gives the results of analyses of various Somali foods. *H. Harold Scott.*

Ferro-Luzzi, G.. Neurite tropicale con blocco parziale del cuore. [**Tropical Neuritis with Partial Heart-Block.**] *Boll. d. Soc. Italiana di Med. e Igiene Trop.* (Sez. Eritrea.) Asmara. 1942, v. 1, No. 4, 5–17.

The condition described—three cases in Europeans are detailed—presents certain similarities to tropical pseudo-tabes already recorded [see this *Bulletin*, 1943, v. 40, 796], but differs in that, in general, the former is less serious and the symptoms are more subjective than objective, and there are no signs of myocardial lesions. It is characterized by circulatory disturbances associated with partial heart-block—cyanosis and dyspnoea—and by neuritis, but there is no oedema or orthopnoea. The neuritis may accompany the cardiac disturbance or may follow it. The heart symptoms are due to a neuritis; the bundle of His is not involved. "Aetiologically and pathologically, *i.e.* pathogenically," says the author, "the condition is closely allied to pseudo-tabes, but has not the characteristic affection of the legs nor any involvement of the cardiac musculature." The prognosis as regards life is good, but, as in all deficiency states, if the conditions under which it arose continue, relapses are common. Vitamin B is needed, together with rest, physical and mental. Camphor preparations give relief temporarily; strophanthus and digitalis are without effect.

H. Harold Scott.

Ferro-Luzzi, G. Rapporti tra beri-beri classico e neurite tropicale degli europei. [**Relation of Beriberi to Tropical Neuritis in Europeans.**] *Boll. d. Soc. Italiana di Med. e. Igiene Trop.* (Sez. Eritrea.) Asmara. 1942, v. 1, No. 4, 18–22. English summary.

Among Europeans, states the author, no case of beriberi was seen during the period 1937–41, either wet or dry, in Eritrea; in 1942 cases began to come to hospital. During the same period he saw six cases among the natives presenting typical symptoms, and all between the ages of 20 and 30 years. They exhibited oedema of face and legs, oliguria and muscular weakness. Later, the oedema spread to involve the whole body and praecordial oppression and palpitation appeared. According to the author's experience and from a study of the records the natives do not suffer from the tropical polyneuritis which attacks Europeans. There is no close affinity between the two diseases, because avitaminosis is not a cause of the tropical neuritis and, he maintains, the latter is not a "geographical variety of beriberi" and, though vitamin B rapidly benefits true beriberi, it has little or no effect on the other disease.

H. Harold Scott.

Cimmino, V. Grave sindrome carenziale "B" successiva a febbre ricorrente. [**Severe Symptoms of Avitaminosis B after Relapsing Fever.**] *Boll. d. Soc. Italiana di Med. e Igiene Trop.* (Sez. Eritrea.) Asmara. 1942, v. 1, No. 5, 45–50. English summary (4 lines).

Post-infective neuritis may be ascribed to deficiency of vitamin B, the febrile process leading to rapid using up of the vitamin, especially when the patient has previously been living on the borderline of deficiency. So postulates the author and quotes the following case in support of his contention. A native youth of 17 years, a prisoner, passed through an attack of relapsing fever with spirochaetes in the blood.

Seven weeks later he had slight fever, with malaise and dyspnoea. The heart, which, when previously examined, had been found normal, was enlarged; the blood-pressure was 110/60, pulse soft, small, regular. No spirochaetes could be found. The cardiac enlargement increased gradually and the patient began to complain of pain in the legs particularly along the nerves, and some oedema of the face and legs appeared; knee-jerks were reduced, Achilles reflexes absent. Urine output small, but no abnormality was detected in it. Anasarca became general; the heart took on a gallop rhythm and death took place. Autopsy revealed little: moderate pericardial effusion, pericardial staining especially on the anterior aspect, organ enlarged, flabby, musculature pale, valves normal. Degeneration and stasis in the liver and "renal degeneration" [not defined otherwise]. *H. Harold Scott.*

GREGORY, M. K. **The Ocular Criteria of Deficiency of Riboflavin.** *Brit. Med. J.* 1943, July 31, 134–5.

This article should be read by all those who are interested in the subject which forms its title.

A few quotations from Dr. Gregory's paper will best indicate what follows:—

"There has been a spate of enthusiastic but uncritical investigations. It is therefore necessary that there should be some attempt to clarify the confusion of thought and to correct the looseness of terminology that has arisen . . . it is essential that observers first should have an exact knowledge of the normal blood supply and arrangement of vessels at the limbus; secondly, they should have an accurate idea of the changes which, in the light of our present knowledge, may be expected to occur; and, thirdly, they should know what other conditions may produce somewhat similar appearances and how these may be distinguished. I propose to give a brief outline of these three points."

"*The Normal Blood Supply of the Limbus.* The pericorneal plexus is in two layers—the superficial conjunctival and the deep episcleral . . . This deep ciliary congestion is always a serious sign as indicative of uveal disease, but superficial circumcorneal injection can be transiently produced by vigorously rubbing the eye for a moment; and it results from irritations such as exposure to wind, cold, bright light, mild chemical irritants, mild infection, and numerous other causes. . . .

"Thus it is normal for vessels to occupy the whole width of the limbus, and there is not necessarily an avascular zone between the plexus and sclero-corneal junction; and capillaries which do not extend beyond the limbus thus defined are considered to be within the limits of normal.

"*Ocular Appearances in Riboflavin Deficiency.* The chief sign is a superficial invasion of the cornea by very fine capillaries arising from the apices of the marginal loops. These lie just deep to the epithelium and extend evenly as streamer-like vessels which anastomose to form a series of loops from the apices of which more capillaries grow towards the centre, giving the appearance, with the slit-lamp, of fine almost parallel vessels extending on to the cornea round the whole of its periphery in both eyes. . . .

"*Other Causes of Corneal Vascularization.* The cause of the most extensive vascularization of the cornea is interstitial keratitis . . . Some other conditions in which vascularization of the cornea may occur

are vitamin A deficiency, tryptophan deficiency, injury of corneal epithelium due to chemical irritants, diseases causing pannus, such as trachoma, phlyctenular keratitis, pannus degenerativus, and also any superficial keratitis."

The author discusses these and concludes " I would, however, advocate most strongly that those interested should acquire an accurate picture of the signs indicative of this deficiency, so that large quantities of this expensive vitamin preparation . . . . will not be given empirically or unnecessarily, and considerable time will not be wasted in investigating signs that have no real diagnostic value."

H. S. Stannus.

Seitz, W. Ueber gastroenterogene Pellagra. [**Pellagra of Intestinal Origin.**] *Deut. med. Woch.* 1943, Apr. 30, v. 69, No. 17/18, 365–7, 2 figs. [18 refs.]

The patient, a smith of 56 years, had suffered on and off for nearly 20 years from gastric and intestinal symptoms. In 1922 a gastroenterostomy was performed on account of gastric ulcer. Since 1927 he had had pain after eating, and once brought up blood. From the middle of 1941 he had been much troubled with diarrhoea. The stools showed occult blood and the patient had become emaciated. An exploratory laparotomy was undertaken for suspected ulcer or malignant disease, but neither was found. In the following spring he complained of pain in the legs, of a sciatic character, and his tongue was fissured. Exposure to the sun's rays while he rested in the garden in a *chaise longue* for an hour one day and a quarter of an hour the next was followed by blistering of the face and backs of the hands, the only parts exposed. When seen a few days later he presented the typical symptoms of pigmentation of exposed parts, rhagades, stomatitis, atrophic lingual papillae, dry and fissured fingernails. The gastric juice contained no free HCl, even after histamine. Psychic symptoms comprised indifference to surroundings, slow speech, absent-mindedness and lack of concentration and, at times, bewilderment. Nicotinic acid, 100 mgm. Nicobion intramuscularly daily, led to rapid amelioration of all symptoms except the diarrhoea. Acting on the general idea that in pellagra the adrenals are not functioning properly, the author prescribed this hormone, but its use was followed rapidly by an alarming oedema. This fact tends to support the notion that in pellagrins the oedema is not due to " deficiency of the antipellagra factor, but to some other vitamin (B_1) or reduction of protein." [The condition of the hands is well shown in an illustration, that of the face and mouth not so well, as the photograph has been much reduced and not well reproduced.]

H. Harold Scott.

Riordan, T. J., Gellis, S. & Rubinowitz, A. M. **Unusual Sites of Lesions in Pellagra. Gangrene of the Toe in One Case.** *Arch. Dermat. & Syph.* 1942, Nov., v. 46, No. 5, 661–4, 3 figs.

The common sites of the skin lesions of pellagra are the backs of the hands and the neck ; they are rarely found elsewhere (2·4 per cent. in one large series). The authors report three cases of unusual distribution of these lesions :—beneath the breasts, in the intergluteal region, and around the vulva and inner sides of the thighs. There were lesions on the hands as well. In one case an area of pellagrous

dermatitis on the great toe had led to local gangrene which necessitated amputation. All the patients were negroes and heavy drinkers, all had mouth symptoms and two had peripheral neuritis. Nicotinic acid and thiamin were successfully used in treatment. *C. W.*

HANSEN-PRUSS, O. C. **Pellagra developing in a Patient receiving Liver Extract parenterally for Sprue.** *Southern Med. J.* 1943, June, v. 36, No. 6, 440–42.

In a series of 66 patients with the sprue syndrome, no instance of pellagra, beriberi or scurvy accompanying the sprue state has been found.

When first studied, the patient who forms the subject of this paper presented the complete picture of sprue cachexia, from which he recovered satisfactorily with parenteral liver and dietary, but when readmitted 17 months later he was suffering from unmistakable pellagra and recovered under treatment with nicotinic acid. The development of the pellagra state coincided with the progress of a pyloric obstruction with 65 per cent. retention of barium; a stenosing ulcer was present in the duodenal bulb. When pellagra became manifest his blood haemoglobin and red cell values were within normal limits and the bone marrow had reverted from a megaloblastic to the normal type. Furthermore, the stool fat content was within normal limits and the glucose tolerance test showed an increase in the blood sugar curve.

The sequence of events suggests that refined liver extract does not contain the pellagra-preventive factor. *P. Manson-Bahr.*

HAEMATOLOGY.

RANDOLPH, T. G., with the technical assistance of Elizabeth B. GIBSON. **Enumeration and Differentiation of Leukocytes in the Counting Chamber with Propylene Glycol-Aqueous Stains.** *Proc. Soc. Exper. Biol. & Med.* 1943, Jan., v. 52, No. 1, 20–22.

The known haemolytic and solvent properties of the glycols suggested their use in diluting and staining fluids for white cell counting. In a diluting fluid consisting of a 50 per cent. aqueous solution of propylene glycol the erythrocytes became almost invisible within 5 minutes while the leucocyte counts remained unchanged for 60 hours. Furthermore, owing to the viscosity of the glycol mixture an accurate end point was attained more easily in filling the diluting pipette, and there was less settling and clumping of the cells in the pipette than with acetic acid diluting fluid. There was also less tendency to overflow the counting chamber when filling, less red cell débris was seen in the background of the preparation, and the mixture evaporated more slowly. The addition of eosin and methylene blue to the fluid allowed a differential count to be made with the 4 mm. objective, and avoided the disadvantages of unequal distribution of the cells and the difficulty of identification of "smudge" cells met with in smears, but for complete differential counts the method would appear supplementary rather than an alternative to the use of stained films.

The most satisfactory results were obtained by making up two stock solutions. Solution I consisted of methylene blue 0·1 gm. in propylene glycol 100 cc. and Solution II of eosin B 0·1 gm. in distilled water 100 cc.; the eosin solution may require filtering occasionally as a fine precipitate may form on keeping. A mixture of equal parts of these solutions is used as the diluting fluid in a standard white blood cell counting pipette, the total and differential counts being made in a standard counting chamber. The diluted blood should remain 15 minutes in the pipette for maximum staining, and 3 minutes should be allowed in the counting chamber for the cells to settle.

F. Murgatroyd.

Rubiano Groot, H. "Algunos conceptos personales sobre 'anemia de los trópicos' y fisiopatología del edema en este sindrome." [**Anaemia in the Tropics and Associated Oedema.**] *Medicina.* Bogota. 1943, Mar., v. 5, No. 51, 65–96.

This article occupies the whole of this number of the Journal. The author discusses the subject of anaemia in the tropics associated with intestinal disturbance, diarrhoea or constipation, anorexia, headache, weakness, insomnia, oedema and other vague symptoms, and gives notes of a large number of patients presenting very similar histories. Of 51 such, 38 were passing ova of hookworms, one of Strongyloides, and 12 had no such infestation. He concludes that tropical anaemia occurs without ankylostomiasis, and ankylostomiasis without anaemia. He then proceeds to consider the pathogeny of oedema, discussing cardiac, renal and hepatic diseases and metabolic disturbances, and finds that the oedema of tropical anaemia is consequent on hepatic inadequacy and a result of dietetic deficiency, notably of vitamin B. He acknowledges that these cases may interact; thus uncinariasis may lead to nutritional disturbance, which in turn sets up the syndrome of tropical anaemia. Hence hookworm campaign units must, in addition to getting rid of the parasite, pay due attention to nutrition and nutritional defects. [There is not very much new in this, but it is an interesting and careful study.] *H. Harold Scott.*

VENOMS AND ANTIVENENES.

De, S. S. **Antigenić Properties of Crystalline Haemolysin.** *Ann. Biochem. & Exper. Med.* 1942, v. 2, No. 4, 237–44. [11 refs.]

The immunological specificity of crystalline haemolysin from certain snakes has been tested. The activities of those from two varieties of *Naja tripudians* were 3,360 and 3,318 haemolytic units respectively per mgm., that from *Bungarus fasciatus* was 1,650 units. Antihaemolysin was obtained by injecting rabbits with 5 mgm. haemolysin at intervals of three days for 30 days. Then to 1 cc. of serum were added in a test-tube 1 cc. of haemolysin in various dilutions and 8 cc. of 0·85 per cent. NaCl. The tubes were examined after 30 minutes at 37°C. Ten cc. of serum diluted 1 : 10 gave maximum precipitation with 1·5 mgm. of the haemolysin.

By experiment it was found that the haemolysins of the two varieties of *Naja tripudians* were similar, but that of *Bungarus fasciatus* was different, as judged by cross-precipitation, and neutralized less than half the amounts of the former.

The author also studied the effect of ultra-violet light on the haemolysin and the effect of reducing agents on the irradiated products. It was found that a 1 per cent. solution of the crystalline haemolysin was half inactivated within 10 minutes. The oxidized haemolysin was found to produce anti-haemolysin in a proportion equivalent to that obtained from the active enzyme, but the irradiated enzyme had lost this property. Further, oxidized enzyme can be reactivated, irradiated enzyme cannot. In other words, crystalline haemolysin is irreversibly destroyed by exposure to ultra-violet light. *H. Harold Scott.*

BOQUET, P. & VENDRELY, R. Influence du *p*H sur la transformation du venin de cobra en anavenin par l'aldéhyde formique ; préparation d'un anavenin solide. [**Influence of *p*H on the Preparations of Anavenene.**] *C. R. Soc. Biol.* 1943, Mar., v. 137, No. 5–6, 179–80.

Solutions of cobra venom treated with formaldehyde lose toxicity more quickly in neutral or slightly alkaline solutions than in acid solution. The protein precipitate which is formed is equivalent to solid anavenene. *C. W.*

WALKER, N. F. **Two Cases of Spider-Bite.** *South African Med. J.* 1943, Feb. 13, v. 17, No. 3, 44–54.

These occurred in Madagascar ; in neither case was the insect identified. The symptoms were : intense general pain, sweating (in one case of one side of the body only), rapid painful respiration and vomiting. Morphine was effective in relieving pain only after repeated doses, but adrenalin relieved the respiration and cyanosis. In one case there was board-like rigidity of the abdomen [similar to that described in bites of *Latrodectus mactans*].

Both patients recovered after a few days. *C. W.*

HALTER, B. L. & KUZELL, W. C. **Black Widow Spider Bites in the Adult Male.** *Milit. Surgeon.* 1943, Apr., v. 92, No. 4, 427–32.

Seventeen cases are reported ; all recovered. The treatment given included the intravenous injection of calcium chloride in doses of 10 cc. of a 10 per cent. solution. *C. W.*

DERMATOLOGY AND FUNGOUS DISEASES.

REISS, F. **Syringadenitis Suppurativa Tropicalis (a Complication of Lichen Tropicus). Histologic Appearance and Etiologic Considerations particularly as to a Possible Relationship of Ascorbic Acid and Carbohydrate Metabolism.** *J. Lab. & Clin. Med.* 1943, June, v. 28, No. 9, 1082–92, 3 figs. & 1 chart. [37 refs.]

Only a few patients suffering from prickly heat show severe involvement of the face but it is these cases who are most often subject to the

complication here discussed. Local itching may be absent or considerably attenuated, being replaced by an increasing sensation of tension over the face (rarely over the buttocks or the submamillary regions). This is followed by the development of numerous painful superficial and deep nodules about the size of a split pea and larger. After being covered by a shiny red skin for some days suppuration appears or at times resorption seems to occur without the development of pus. Scarring is not a frequent sequel but some post-inflammatory pigmentation often persists for many weeks after the active lesions have subsided. The twenty patients here considered were all Chinese and the course of the disease was from four to ten weeks. Histological and cultural investigations all support the expected findings, *viz.*, infection with staphylococci. Some evidence is brought forward which suggests that infection of the sweat glands occurs more easily where there has been excessive loss of vitamin C with some changes in the carbohydrate metabolism, which may be summarized as a low fasting blood-sugar level and delayed glucose excretion. Appropriate local applications were used, whilst internal medication included the administration of ascorbic acid, 200–1,000 mgm. daily. Neither the sulphonamide drugs nor toxoid gave encouraging results. *Sydney Thomson.*

PINKUS, H. **Chronic Scarring Pseudofolliculitis of the Negro Beard.** *Arch. Dermat. & Syph.* 1943, June, v. 47, No. 6, 782–92, 9 figs.

Attention has been called to a peculiar disease which affects the bearded skin of a large percentage of negroes. It is due to the strong curved shaved hairs growing back into the skin and causing irritation, foreign body inflammation and eventually scarring. The clinical picture is characterized by hairs which extend for a short distance above and parallel to the surface, both ends being buried in the skin (loop hairs, *poils recourbés* of DUBREUILH, *pili recurvi*). The follicle of the hair is normal, while there is an inflammatory papule or papulopustule around the free end. Later in life, inflammatory reaction is less pronounced and the hairs lie in shallow grooves. Still later, the hairs degenerate, leaving the skin criss-crossed by narrow depressed scars, which give the cheeks of many of the older men a characteristic appearance. The designation of chronic scarring pseudofolliculitis (pseudofolliculitis chronica cicatrisans) is proposed for this condition.

"Histologic examination by means of serial sections and three dimensional large scale reconstruction (Dr. Felix PINKUS) has shown that there is a fundamental difference between ingrown hairs of straight, wavy or curly beards and the loop hairs causing pseudofolliculitis. The ingrown hair of a white man is a hair which has been shaved too close, has slipped back beneath the surface and, owing to continuing growth, has made a false path through the side wall of the follicle into the cutis instead of emerging at the follicular opening. The negroid hair emerges normally, but owing to its inherent curve, grows back into the skin if it is not shaved close enough." *Sydney Thomson.*

SATULSKY, E. M. & WIRTS, C. A. **Dermatitis Venenata caused by the Manzanillo Tree. Further Observations and Report of Sixty Cases.** *Arch. Dermat. & Syph.* 1943, June, v. 47, No. 6, 797–8.

"A further report is made on the irritating action of the manzanillo (beach apple or shore apple) tree found in the Republic of Panama and the Canal Zone.

" A brief summary of 60 cases of dermatitis venenata caused by this tree is reported."

SIGALOS, P. Die chirurgischen Mykosen in Griechenland. [**Surgical Mycoses in Greece.**] *Deut. Ztschr. f. Chirurgie.* 1943, Mar. 24, v. 257, No. 5 & 6, 303–15.

Hitherto cases of mycotic infection in Greece have been recorded individually; the author has studied these and in the present article (which has been published also in Greek) he deals with the subject more generally, but does not state over what length of time these have been distributed. He divides them into three classes: Actinomycosis, Streptotrichosis, and Blastomycosis.

I. *Actinomycosis.*—Forty-four cases are analysed; forty proved bacteriologically, four clinically only. In addition there were 12 cases of mycetoma of the foot. The youngest patient was 12 years, the oldest 70 years of age; six were between 12 and 20, then in successive decades 13, 12, 11, 9 and five. In 23 the face and neck were involved, in 10 the lungs and pleura, in another 10 the abdomen, in 20 the foot and in one the lower jaw (not included in the face and neck cases). In 22 of the face and neck cases the organism was isolated. The lesions were generally distributed—neck, jaw, parotid, submaxillary regions, the gums. In the thoracic cases, lungs and pleura and the walls were involved with fistulous formations and abscesses, and autopsies might reveal metastatic deposits in other internal organs. Abdominal lesions were largely confined to the wall, but the bowel might be involved, mainly at the junction of the ileum and caecum. The " foot " cases were all in peasants, most of them engaged in agriculture or cattle-rearing. From nine of these *Actinomyces madurae* was obtained, from three *Indiella regnieri.*

II. *Streptothrix.*—Thirty of these were found; the localizations of the lesions were: Face and neck 8, lungs and pleura 8, abdomen 5, kidneys 2, bones 2, soft parts of the limbs 3, multiple two. The disease was characterized by chronicity and tendency to relapse. From most of them an anaerobic streptothrix was isolated. The pulmonary form was very likely to be misdiagnosed, in the earlier stages at least, as tuberculosis, and in fact in more than one phrenic avulsion or artificial pneumothorax was performed. In three of the five abdominal cases the wall was involved, in two the retroperitoneal aspect of the caecum. The two " kidney " cases were exclusive of those in which these organs were invaded by metastases. There were pyonephrosis and perinephric abscess. The " bone " cases, like the pulmonary, were by many regarded as tuberculous. Those with wide distribution, whose original site could not be determined, showed lesions of liver, shoulder-girdle, sternum, temporal region, axilla, and abdominal wall.

III. *Blastomycosis.*—Only a few of these were seen, or found [the number is not stated]. In one the wrist was involved, in another the lung, in a third a kidney.

Non-surgical mycosis is briefly mentioned, notably of the eye and tear duct, nose, mouth and skin, the cause being Streptothrix, or Trichophyton (*T. violaceum*) or Aspergillus.

Treatment, apart from surgical operation (removal of the affected area, amputation of foot, etc.), comprised mainly potassium iodide in large doses. Fat subjects tolerated very large doses, one man taking as much as 39 gm. in one day and a total of 920 gm. Iodine in alcohol or

glycerin might be applied locally, but strong preparations damaged the tissues and prevented absorption. X-rays without administration of iodide proved ineffectual. *H. Harold Scott.*

MISCELLANEOUS.

Tonkin, A. H. **The Transkei Division.** *South African Med. J.* 1943, May 22, v. 17, No. 10, 151.
Mears, G. **The Transkeian Territories.** *Ibid.* 151–2.
Tobias, J. M. **Medical Practice in a Typical Transkeian District.** *Ibid.* 152–3.
Paterson, R. L. **Medical Missions in the Transkei.** *Ibid.* 154–6.
Tonkin, A. H. **The Registration of Births and Deaths of Natives.** *Ibid.* 156.
Mears, A. R. R. **One of the Profession.** *Ibid.* 157–8.
Joynt, E. P. H. **The Butterworth Area.** *Ibid.* 158.
South African Med. J. 1943, May 22, v. 17, No. 10, 159–66. **Medical Problems of the Transkei.** [Discussion.]

The whole of this issue of the *South African Medical Journal* is devoted to the medical problems of the Transkei. To this extent it is, of course, of local importance, but most of the major issues may well have an application to African territories beyond the Union. It is noteworthy that most of the contributors, have, from their different experiences, reached the same conclusions, namely, that the over-riding factors in health are deficiency of nutrition and ignorance, and urge that unless these matters are efficiently and promptly dealt with, there can be no likelihood of improvement in health. They realize, moreover, that improvement in nutrition can only be achieved by improved agriculture and animal husbandry.

Mears points out that though for agriculture and stock raising the country is well suited, it has now become saturated with beasts, especially sheep, and that as a consequence many animals die through starvation. Other contributors show that animals are not commonly kept for their food-producing capacities, but rather as evidence of wealth; that the milk yield is falling because of overstocking, so that in many areas milk is hardly available as a human food; that soil erosion is increasing; that rotation of crops is not practised and that the land is therefore deteriorating. The result in man is malnutrition so severe that "fifty or sixty per cent. of the children die through malnutrition before reaching the age of two years."

Mears states that the population is not ravaged by any specific disease, but others show that tuberculosis is fast assuming the proportions of a major health problem, and relate the increase partly to the poor standard of living and partly to contact infection within the ill-ventilated huts in which the families live. Venereal disease, though fairly common, is not regarded as a principal risk. De Villiers notes that plague and typhus break out each year in some part of the Transkei.

Of the nutritional diseases Tobias particularly mentions nutritional oedema as a cause of the high infant mortality rate, which he estimates

at about 70 per cent. Scurvy and pellagra are mentioned by Paterson, who also refers to more latent forms of dietary deficiency, but it is generally conceded that these deficiencies are widespread.

Contributors to this discussion make constructive suggestions for improvement which are by no means merely vague generalizations, but the details cannot well be abstracted. No doubt many of these are mainly applicable only in the existing circumstances and would need modification for other countries, but there is little doubt in the mind of the reviewer that Government authorities faced with similar problems in other countries would benefit by a detailed study of the many proposals here laid down. In general, the impression received is that the native tends to be too much an individualist and therefore farms uneconomically when economy is necessary even for minimal tolerable existence. It is considered that some degree of compulsion is necessary to constrain the people to a more fruitful mode of life, that the situation has become such that less forceful methods are likely to fail. The whole emphasis is on the basic subject of efficient farming.

The minutiae of these subjects are discussed at some length, but cannot be reproduced in an abstract; they include not only the specific proposals as to the improvement of agriculture, but also suggestions concerning the provision of adequate medical facilities. It is clear, however, that the contributors to this important issue of the *South African Medical Journal* are fully aware that the well-being of the people can only be attained by close co-operation between Government and all the relevant technical services, medical, agricultural and the rest. There is nothing new in this attitude, but it is well that it should be so emphatically stated. *C. W.*

Browne, G. St. J. Orde. **Labour Conditions in Ceylon, Mauritius, and Malaya.** Cmd. 6423. 113 pp., 4 diagrams. 1943. London: H.M. Stationery Office. [2*s.*]

This report is concerned with all aspects of labour conditions, but there is considerable mention of the health of the labourers. The author, who has had long experience of this kind of work, criticizes and discusses such matters as housing, sanitation and diet of plantation labourers. No detailed abstract of his findings is possible, but the suggestions he makes should be brought to the notice of all Government officers and plantation managers of the countries concerned, and even beyond, since some of them are of very wide application. For instance, he urges that specialist appointments should be given to medical officers who have experience in the problems of labour, so that they may better supervise and co-ordinate the work. He also mentions the "unfortunate experiment" of Bell Village in Mauritius, where a housing scheme was started 15 years ago, but was not a success because the buildings were unsuitable, the lay-out was not liked by the natives, and the area was malarious—"a melancholy example of a promising scheme carried out with insufficient foresight and experience."

There are many constructive suggestions throughout the report.
C. W.

Colonial Office. **Labour Supervision in the Colonial Empire 1937–1943.** Colonial No. 185. 26 pp. 1943. London: H.M. Stationery Office. [6*d.*]

Medical Research Council. **The Medical Use of Sulphonamides.** M.R.C. War Memorandum No. 10. 46 pp. 1943. London: H.M. Stationery Office. [*9d.*]

This monograph has been written by a number of authors for the Therapeutic Requirements Committee of the Medical Research Council as a guide to the use of sulphonamides "in the light of their present or potential availability in Great Britain." It deals first with the chemistry and nomenclature of the principal compounds, and with their behaviour as drugs—mode of action, absorption, distribution, acetylation and excretion: a table of solubilities including those of acetyl compounds, in water, serum and urine is given. The general principles of treatment are then described, and a comprehensive scheme of dosage is given, with a discussion of administration by different routes, and of the regulation of dosage by estimating the sulphonamide level in the blood. The main specific infections amenable to treatment are then described, some being classified according to the causative organism, and some regionally—*e.g.* peritonitis, urinary tract infections, wounds, burns. In the second category there is much up-to-date information on the effect, particularly of sulphaguanidine and succinyl sulphathiazole, in various intestinal infections. Shorter accounts are given of what is known of the treatment of 16 other miscellaneous conditions. There can be very little of any value which is omitted from this comprehensive survey, although some specific reference might perhaps have been made to subacute bacterial endocarditis: "non-haemolytic streptococcal infections" are mentioned only in general terms, with a warning that they are rarely susceptible to treatment. There is a full description of toxic reactions, with a table of the reported frequency of 25 such effects following the administration of four different compounds. An appendix gives methods for estimating sulphonamides in body fluids, for determining the susceptibility of a micro-organism to sulphonamides, and for sterilizing sulphanilamide powder for local application. There is no bibliography, but some references, mainly to recent or not generally familiar work, are given in the text.

This memorandum is a comprehensive and reliable guide to sulphonamide therapy in all its aspects, which should do much more than ensure that drugs in short supply shall be used to the best advantage. It is a model of concise exposition and the reader will find it difficult to believe on reaching the end of it that all the information it contains has been compressed into so small a compass. *L. P. Garrod.*

Gokhale, P. V. **Note on the Sandawe Tribe of the Kondoa Irangi District, Tanganyika Territory.** *East African Med. J.* 1943, Feb., v. 20, No. 2, 62.

In the examination of 1,500 recruits in the Kondoa Irangi district of Tanganyika Territory, Gokhale noted the absence of tropical ulcer in members of the Sandawe tribe. It appears that members of this tribe keep themselves aloof from neighbouring peoples, do not travel to seek work, but are great hunters and collectors of wild honey. They are poor agriculturists, and most of the grain (millet) they grow is used to make beer. Their diet consists of meat, milk, honey, cassava and sweet potatoes, and they like dried fish. This diet should give a high blood calcium, and if tropical ulcer is associated with low calcium

values, this may be an explanation of their freedom. As they do not eat vegetables the availability of the calcium in the diet is not reduced by the presence of oxalates.

In other tribes in the same district ulcers are very common.

C. W.

RÖPKE, F. Das hämostatische Geschwür in warmen Ländern. [**The Haemostatic Ulcer in Warm Countries.**] *Deut. Trop. Ztschr.* 1943, Apr. 15, v. 47, No. 8, 181–93. [10 refs.]

This is a theoretical discussion of the causes of tropical ulcer based on observations of about 50 cases in the North African war areas and earlier experience in German East Africa. The author thinks that tropical ulcers are caused by injuries, often very slight, to parts of the skin with diminished vitality such as the ankle and foot. This diminished vitality is brought about in African natives by their changed habits of life, produced by contact with European civilization. In his natural surroundings the African native moves about or squats or lies down but rarely stands for long periods or sits on forms, chairs, or stools, as he does when in the service of Europeans. This standing or sitting without support for the tissues of the leg interferes with the venous return of blood and so the vitality of the skin and superficial tissues is impaired. The support given by tight clothing such as puttees will prevent the occurrence of tropical ulcer. The state of health and nutrition of the body plays a minor part. In the Mediterranean war area the native population, who do little standing and sitting, and clothe their legs, and the British troops who wear puttees, are almost free from tropical ulcers, while German soldiers, living under the best hygienic conditions, but who are given more liberty in regard to clothing, suffer greatly from tropical ulcer.

The ulcers were nearly always on the leg or foot but the author saw one on the lower part of the thigh, one on the wrist and two on the neck. He never saw an ulcer on the front of the knee, although it is often injured and this is probably owing to a good blood supply to this part. Usual methods of local treatment are mentioned. *J. F. Corson.*

BROCKLEBANK, J. A. **The Radiological Appearances of Bone in Cases of Tropical Ulcer.** *Brit. J. Radiology.* 1943, Aug., v. 16, No. 188, 221–4, 15 figs.

Tropical ulcer begins as a pustule, usually near the ankle, which rapidly develops into a painful sloughing ulcer with much purulent discharge, and the deeper tissues, including bone, may be affected. The author describes the radiological appearances in some of these cases. Involvement of bone begins as periostitis, then the inflammatory process extends to the underlying cortex, producing osteo-periostitis with superficial erosions of the bone. The author believes that if this stage is reached, osteomyelitis always follows, usually within three months, and often affects the whole length of the tibial diaphysis. He has not observed involvement of the epiphyses. It is remarkable that with such extensive bone lesions, there may be little impairment of general health and activity. It may be difficult to differentiate the radiological appearances from those found in yaws and syphilis, both of which are common in West Africa. The author has also observed very similar appearances in England in a case of osteomyelitis due to *Bact. coli commune.* *J. F. Corson.*

Placeo, F. Contributo clinico su 50 casi di ulcera tropicale in bianchi trattati con metodo chirurgico (circoncisione). [**Fifty Cases of Tropical Ulcer in Europeans. Surgical Treatment by Peripheral Excision.**] *Boll. d. Soc. Italiana di Med. e Igiene Trop.* (Sez. Eritrea.) Asmara. 1942, v. 1, No. 4, 48–53.

The author does not touch on the pathology or aetiology of tropical ulcer. All he is concerned with is to describe a form of treatment which has proved very successful in his hands. Even severe ulcers of long standing have healed and cicatrized in at most seven weeks, and often in 30 days. The patients are kept in bed for 15–20 days. During the first 4–8 days the ulcer is cleaned by allowing Dakin's solution to drop on it twice daily for an hour at a time ; in the intervals a protective ointment is applied. Then the skin is incised, down to the fascia, at a distance of 1–2 cm. from the margin of the ulcer, in order to cut off completely the superficial blood-supply. This procedure, which the author designates " circumcision," is followed by scraping of the granulations with a Volkmann's spoon and the application of a simple ointment. This is removed 48 hours later and sterile vaseline is applied daily until cicatrization is complete. *H. Harold Scott.*

Walker, J. W. & Charters, A. D. **A Case of Leech Infection.** *East African Med. J.* 1943, Apr., v. 20, No. 4, 114–16, 1 fig.

An Abyssinian boy, about seven years old, was seen to be suffering from severe epistaxis. He complained of sore throat and bleeding from the nose and mouth of two days' duration. He was faint and anaemic. Blood cell counts could not be made but the haemoglobin was found to be 40 per cent. Examination of the throat showed a round sessile tumour, about one inch in diameter, attached to the posterior surface of the right tonsil, and there were two petechial spots on the right anterior pillar of the fauces. A diagnosis was not made pending further examination under an anaesthetic, and next morning he was reported to have coughed up a " worm " which proved to be a large leech. It measured four inches in length when extended and had a basal sucker half an inch wide and was afterwards identified as belonging to the genus Limnatis. Observation indicated that it was aquatic in habit and it is thought that the boy became infested through drinking water some time previously when the leech was small, as Manson-Bahr suggests (*Manson's Tropical Diseases*, 1941, p. 856). *J. F. Corson.*

White, T. H. **Primary Lateral Sclerosis or Lathyrism ? Case Report.** *East African Med. J.* 1943, Apr., v. 20, No. 4, 121–2.

A young adult male native was admitted to Tanga hospital (Tanganyika Territory) complaining of backache, pain in the legs and inability to walk, of a fortnight's duration. There was spastic paraplegia, the knee- and ankle-jerks were increased, the plantar reflex was of extensor type and ankle clonus was present. Sensation was not diminished. The Wassermann reaction of the blood and cerebrospinal fluid was negative. There was no evidence of avitaminosis and the symptoms suggested lathyrism. The patient improved slowly during the seven weeks of the author's observation and at the end of this period he could hobble around with the aid of a stick.

J. F. Corson.

Marshall, J. F. **The Control of Tank-breeding Mosquitoes in the City of Portsmouth.** 1943, June, 4 pp. British Mosquito Control Institute, Hayling Island, Hants.

The author has had a very large experience, searching for early stages of mosquitoes in static water tanks of many sizes and materials. He finds *Culex pipiens* not very rarely, the eggs being first observed in May and the larvae in June, and the last larvae in October. He also finds larvae of *Anopheles maculipennis* occasionally. No other species was found. The smaller tanks (5 to 10 thousand gallons) are more frequently infested than the larger.

The paper demonstrates that the whole matter is very unimportant, from the point of view of health or comfort, for the Culex does not bite man, and the Anopheles not very commonly, at least in Britain. The author is doubtless right in urging that it is not necessary to apply oil or other larvicidal methods unless larvae have been actually found.

P. A. Buxton.

Senevet, G., Chabelard, R. & Abonnenc, E. Les moustiques de la Guyane. III. Les Sabéthinés (2). [**Mosquitoes of Guiana : Sabethines.**] *Arch. Inst. Pasteur d'Algérie.* 1942, Dec., v. 20, No. 4, 336–48, 7 figs.

Senevet, G. & Abonnenc, E. Les moustiques de la Guyane. IV-2] Le genre *Aedes* (s.g. *Finlaya*). [**Mosquitoes of Guiana : Aëdes.**. *Arch. Inst. Pasteur d'Algérie.* 1942, Dec., v. 20, No. 4, 349–51, 1 fig.

Taylor, F. H. **Contributions to a Knowledge of Australian Culicidae. No. V.** *Proc. Linn. Soc. N.S.W.* Sydney. 1942, v. 67, Pt. 3–4, 277–8, 8 figs. [Summary taken from *Rev. Applied Entom.* Ser. B. 1943, July, v. 31, Pt. 7, 121.]

This paper, which is the continuation of a series, comprises records of *Aëdes aegypti*, L., from Fremantle in Western Australia and six localities in New South Wales that constitute the southern limits of its range, and of *Anopheles punctulatus* var. *moluccensis*, Sw. & Sw., from three places in Queensland. The latter was taken at Cairns and Innisfail with *A. amictus*, Edw., and small numbers of *A. annulipes*, Wlk. ; characters are given distinguishing it from *A. amictus*.

Esaki, T. **A Preliminary Report on the Entomological Survey of the Micronesian Islands under the Japanese Mandate, with special reference to the Insects of Economic Importance.** *Proc. 6th Pacif. Sci. Congr. 1939*, v. 4, 407–15. [Summary taken from *Rev. Applied Entom.* Ser. B. 1943, July, v. 31, Pt. 7, 131.]

This paper is compiled from observations made in 1936 and 1938, and much of the information in the section on Arthropods of medical importance has already been noticed. Apparently no dangerous mosquito-borne diseases occur on the islands, but dengue, presumably transmitted by *Aëdes aegypti*, L., or an allied species, has broken out frequently in the Palau Islands since the Japanese occupation. It is believed to have been introduced by immigrants from the Loochoo

Islands. A large tick, probably *Rhipicephalus sanguineus*, Latr., is often found among weeds in the Marianne Islands. Notes are given on dermatitis caused by unidentified mites, and on bees, wasps and ants that attack man. Various species of Oedemerids of the genus *Eobia*, which cause inflammation on the skin, are abundant on all the islands.

Parrot, L. Notes sur les phlébotomes. XXXXIX. A propos de deux prophlebotomus d'Algérie : *Phlebotomus minutus* var. *signatipennis* et *Phlebotomus fallax*. [*Phlebotomus minutus* **var.** *signatipennis* **and** *P. fallax* **in Algeria.**] *Arch. Inst. Pasteur d'Algérie*. 1942, Dec., v. 20, No. 4, 322–35, 8 figs. [31 refs.]

Lapuishev, D. A. Sur la parasitologie de "creeping disease" en Sibérie. [**The Parasitology of Creeping Disease in Siberia.**] *Med. Parasit. & Parasitic Dis.* Moscow. 1940, v. 9, No. 4, 392–400, 3 figs. [50 refs.] [In Russian.]

Semenova, N. E. Un cas de "creeping disease." [**A Case of Creeping Disease.**] *Ibid.* 401, 1 fig. [In Russian.] [Summaries taken from *Rev. Applied Entom.* Ser. B. 1943, July, v. 31, Pt. 7, 127.]

In the first paper, a detailed account is given of five cases of subcutaneous myiasis of the face and one of the finger observed in 1930–39 in western Siberia. In each case only one larva was present. Four of them, including the one from the finger, were extracted and proved to be first-instar larvae of *Gastrophilus intestinalis*, DeG. Since in all the facial cases there was close contact with horses, the author suggests that the newly-hatched larvae may have been carried from horses to the face by the patients themselves, especially as two of the latter recorded a definite sensation of stinging prior to the development of the myiasis.

In the second paper, a case is described of myiasis on the abdomen and chest of a young boy who lived near Moscow and had close contact with horses. Attempts to remove the larva were unsuccessful.

Meng, C.-H. & Winfield, G. F. **Studies on the Control of Fecal-borne Diseases in North China. XV. An Approach to the Quantitative Study of the House Frequenting Fly Population. C. The Characteristics of a Rural Fly Population.** *Chinese Med. J.* 1942, Oct., v. 61A, No. 1 (Chengtu Edition, v. 1, No. 1), 18–19.

[We are indebted to Dr. Joseph Needham, F.R.S., for the following summary, which was received before the original journal had arrived at the Bureau. Dr. Needham was in China as a representative of the British Council.]

A total of 101,481 flies were trapped by standard methods in nine indoor and nine outdoor stations in four villages of the Lungshan rural area of West Shantung, between May and September 1937. *Musca vicina* was the dominant species in the indoor stations, comprising from 81·5 to 100 average 94 per cent. of the population, with a density index of from 6·7 to 44·3 average 18·9 for the nine stations—this species appeared in June and was present in the largest number in August. *Chrysomyia megacephala* was the dominant species of the outdoor stations, making up from 37·0 to 58·5, average 47·9, per cent. of the

population with a density index of from 48·7 to 374·1, average 191·6—this species appeared in late June and reached a peak in August. The Other Species Group is the next most important, comprising from 22·6 to 61·6, average 44·8, per cent. of the population with a density index of from 63·4 to 422·0, average 177·5, and was already present when trappings started in May and built up to a peak in July. The Other Species Group was equally dense out of doors in both areas although it made up a bigger percentage of the outdoor population in the rural than in the urban area as did the various important species of this group. Among this group both *Muscina stabulans* and genus *Sarcophaga* were definitely more dense in the urban than in the rural area, the indices for *Lucilia sericata* in the two areas were approximately the same, while the index for the Miscellaneous species was definitely much higher in the rural than in the urban area.

[For parts XIII and XIV of this series, see this *Bulletin*, 1942, v. 39, 650.]

NICHOLAS, L. **Demodex Folliculorum: its Incidence in Routine Histologic Study of the Skin.** *Arch. Dermat. & Syph.* 1943, June, v. 47, No. 6, 793–6, 1 fig.

The author has examined 1,750 sections of human skin, submitted for routine histological study. He calls attention to the characteristic appearance of a fragment of the mite *Demodex folliculorum* as it appears in a stained section and publishes a photomicrograph showing parts of several mites in a hair follicle: the striations on the cuticle of the mite [wrongly referred to as "segmentation"] are clearly visible in the figure.

In the 1,750 specimens [all or nearly all of them from abnormal skins, one may suppose] mites were detected in 40 (2·3 per cent.): they were associated with various types of naevus (11 cases), epithelioma (17) and a variety of other conditions. They were much commoner on the face (32) and particularly the nose (9) than other areas, indeed they were very unusual on the trunk.

These results support the view that the mite is not pathogenic. [It is not possible to assess the work for no data are given as to the number of skins without mites in the various groups. For instance were naevi and epitheliomata particularly frequent in the series: what proportion of the total was from the face or the trunk?] *P. A. Buxton.*

HIRSH, J. **Comfort and Disease in relation to Climate.** *Yearbook of Agriculture, 1941.* Washington. 237–45. [10 refs.] [Yearbook Separate No. 1798.] [Summary appears also in *Bulletin of Hygiene.*]

People in every region are interested in how to be comfortable and healthy under a given set of climatic conditions. In the present paper the author discusses the way in which the human body adjusts itself to changes in temperature and humidity, together with the remedial measures which can be applied under adverse conditions. The influence of climate upon disease is also briefly reviewed.

The body automatically maintains a nearly constant temperature by the regulation of internal heat production—*i.e.* the metabolic rate—and the control of heat retention and heat loss through respiration, blood

circulation and secretion by sweat glands. During cold days the blood vessels near the surface of the skin contract and lie deeper in the skin; this conserves the body's heat and the skin appears pale and pinched. On warm days, however, or under conditions of physical activity, the surface blood vessels dilate and the skin takes on a rosy hue. The blood carries heat to the surface, where it can be lost to the air. Heat is also lost in the evaporation of sweat and in exhaling.

Subjective sensations of comfort, however, depend not only upon temperature, but also upon air movement, air humidity and the radiation effects from surrounding surfaces. In assessing an environment the effect of combining some of these factors must be considered. Thus the American Effective Temperature scale takes note of the temperature, humidity and rate of movement of the air, while the British Equivalent Temperature scale combines air temperature, air movement and the radiation component.

The major problem in controlling indoor atmospheres is to maintain the balance between heat production and heat loss in the body. In the Temperate Zone people spend a considerable part of their time outdoors where they have no control over atmospheric conditions. In conditioning homes in these latitudes, therefore, indoor temperatures should approximate outdoor conditions as much as possible without detracting from subjective comfort. In other words, houses should not be kept too hot in winter or too cool in summer.

Diseases caused directly by climate are few in number. Among the more familiar ones are heat exhaustion, heatstroke, snow blindness, frostbite and mountain sickness. Climate has an indirect influence also in favouring or inhibiting the growth and virulence of some of the microscopic organisms that cause disease. This is especially true of malaria parasites and hookworms; the causal organisms require special conditions of temperature and moisture in order to live. Many other diseases, such as the common cold, pneumonia and infantile paralysis, show the effects of some climatic factors by exhibiting a seasonal pattern. The greatest number of cases of the common cold, for example, occur during the winter months and the least during the summer months, but how far these effects can be due to changes in temperature and humidity, etc., is difficult to determine.

C. G. Warner.

BOOK REVIEWS.

CULBERTSON, James T. [Assistant Professor of Bacteriology, College of Physicians & Surgeons, Columbia University]. **Medical Parasitology.**—pp. xii+285. With 16 figs. & 21 plates. 1942. New York: Morningside Heights, Columbia University Press. [$4.25.]

This is a book which can be recommended as giving a clear, orderly and well-balanced account of human protozoal and helminth infections, their causes, diagnosis, treatment and prevention, and their chief vectors. The spirochaetal infections do not come within the scope of

the work, so that rat-bite fever, spirochaetal jaundice, syphilis and yaws are not dealt with ; there is reference to relapsing fever in relation to its vectors.

The volume is well illustrated and there are many excellent photographs. A photograph of a man with elephantiasis is convincing enough, but photographs of sections of tissue containing parasites have, as a rule, a teaching value which is hardly commensurate with the labour and money spent on them. On occasion such photographs may be required in order to convince the sceptic, but he must be a knowledgeable sceptic. What the student at the microscope sees in a stained section will usually convey a great deal more to him than a black and white photograph of the section. Even the aid of an arrow which aims pointedly at the parasites in the tissue may fail to make their presence as evident and their relationship as intelligible as would a simple sketch.

Definitions are likely to remain a difficulty until some authoritative body lays down common acceptations. The author gives the following definitions. " *Infection* : The establishment of a parasite *within* a host, with or without the development of symptoms. *Infestation* : The presence of parasites *externally* upon a host or in the environment." Is a person who is afflicted with scabies or cutaneous myiasis to be regarded as infected or infested ? ' Infection ' appears to meet the majority of cases pretty well. " *Pre-patent period* : The time between invasion by a parasite and the recovery from the patient of some stage of the parasite development. *Incubation period* : The time between invasion by a parasite and the appearance of clinical symptoms." Surely the word ' incubation ' can be used for that period which has elapsed before the parasites are seen, and also for that period before the symptoms appear, if it is preceded by such words as ' parasite ' or ' parasitic ' in the former case, and ' clinical ' or ' febrile ' in the latter.

With reference to different specific names for parasites which appear identical, a case in point is *Leishmania.* " Three species of *Leishmania* infect man : *Leishmania donovani*, which causes the visceral infection kala azar, and *Leishmania tropica* and *Leishmania braziliensis*, which cause cutaneous (Oriental sore) or mucocutaneous (espundia) infections, respectively. The parasites responsible for these several disease entities are indistinguishable in morphology, but the diseases are easily differentiated." It is debatable whether or not it is desirable to retain the disease names if the parasites causing the diseases are in reality morphologically indistinguishable. Nodular and nerve leprosy may appear in the guise of different diseases but it is not as yet believed that they should be attributed to different species of organism.

With regard to the order followed in the book, it is on much the usual lines, the first chapters being largely devoted to a broad consideration of the whole field. Most of us who engage in teaching such a subject as parasitology arrive, after some years, at a stage when we feel that we can take a somewhat wide view of the subject. It is, in fact, about this time that we decide to write a book, and that is perhaps where we go wrong. One result is that, feeling able and willing to make generalizations, we are inclined, in the introductory chapters, to discourse over the whole field with copious allusions, references and illustrative examples. Only after having given this general survey do we come down to the facts. But it is these very facts that students ought to learn first, one by one, just as we ourselves originally had to learn them. In the first chapters of this book the student will find himself much out of his depth. He will not know more than the names

to which the author refers: he has as yet been given no instruction about the parasites to which they belong. A great deal of what is contained in the very useful general chapters up to about number seven would probably prove of greater educative value to the student if it were placed after Part II. By then, but not before, will he know what *Endamoeba histolytica* and *Trypanosoma gambiense* are; what *Necator americanus* and *Ancylostoma duodenale* mean, and the significance of *Wuchereria malayi*, *Glossina palpalis*, *Chrysops*, and so on.

In the malaria section *Plasmodium ovale* takes its place as a definite species. As regards the treatment of malaria, the merits and demerits of quinine, mepacrine and pamaquine are briefly discussed. There is one serious critical comment which it seems necessary to make here. On page 137 the following statement is made: "At the present time the point of view is taken that the drugs themselves seldom cure malaria. They seem instead merely to check the development of the parasite. The final eradication of the causal organism results from the action of the immune mechanism of the host upon the parasite. Hence, present practice dictates, particularly in endemic areas where reinfection is probable, that drug treatment be withheld until the patient has suffered five or six severe attacks of fever and has thus had opportunity to develop immunity." It appears to the reviewer that to follow such advice is likely to expose to grave danger many malaria patients in those endemic areas where *P. falciparum* occurs.

D. B. Blacklock.

TURNER, Percy E. [M.D., B.S., D.P.H., etc.]. **Tropical Medical Manual. For Use and Guidance of Salvation Army Officers on Missionary Service.**—pp. viii+108. Third Revised Edition. With an Illustrated Appendix of Fifty Exercises. Issued by Authority of the General. 1942. London: International Headquarters, 101, Queen Victoria Street, E.C.4.

One of the most difficult undertakings is the writing of a book on medical subjects for non-medical readers. There is the ever-recurring problem of what to leave out, which is every bit as important as what to put in. In order to solve this satisfactorily the author must know thoroughly the mental capacity of the people he is addressing, so that the little learning may not become the dangerous thing. At the same time in circumstances where men and women are in responsible positions, far from qualified medical assistance, the instructions imparted must be direct, dogmatic and sufficiently detailed.

Colonel Turner has fulfilled this task admirably. The book is divided into four parts and there is included a chart of fifty exercises for keeping fit. The first section deals with general principles of prevention of disease and preservation of health—exercise, food, drink, clothing, and so on, with special subsections on the care of European children in warm countries and on the methods of dealing with rodent and insect pests.

The second, and longest, section is given up to diseases and their causation, diagnosis and treatment, including nursing. These are arranged alphabetically, for facility of reference, and perhaps this is as good an arrangement as any for the laity, though a full index with which the book is provided renders it almost unnecessary. Section C is a short one of four pages of Surgical Notes on cuts, bruises, burns, snake-bite and stinging insects. The final Section is concerned with

remedies, including a list of drugs and equipment which should be kept readily available, and prescriptions and doses of medicines and dispensing instructions for preparation of lotions, powders, etc.

Misprints are very few ; the reviewer has noticed only half a dozen. Incidentally, Dr. H. B. G. Newham is called Newman.

We would like to make one or two suggestions for the author's consideration for future editions. First, that it is good to have calico extensions to mosquito nets for beds so that the sleeper does not on a hot night thrust arm or leg against the mesh and so expose himself to biting insects. Second, that where mosquito-proofing of a house is undertaken the doors should open outwards only. Thirdly, regarding the enteric group of diseases no mention is made of carriers or the dangers of convalescent and recovered patients not being scrupulously clean in carefully washing the hands after defaecation and urination, nor of the risk of carriers having to do with preparation of food. Fourthly, though yellow fever is graphically described and suggestions made as regards treatment, nothing is said about protective vaccination for those proceeding to yellow fever countries. This omission is strange in that inoculation against the enterics is given prominence.

The author states (page 56) that hepatitis occurs " in persons who have previously had an attack of amoebic dysentery," but does not add that this may have been months or even years previously, and the layman may think that it follows directly. Again, " Hepatitis may go on to liver abscess, but usually only in people given to excessive alcoholic indulgence " savours of the dicta of abstinence enthusiasts rather than the considered statement of a scientist, and, in fact, is not in accordance with the experience of most workers in the tropics.

We understand that this book is for the use and guidance of Salvation Army Officers and is not obtainable by others. This is a pity, for there is no book of its size so good, so comprehensive and so succinctly written, and missionaries of all denominations would profit much from having it to refer to in difficulty. *H. Harold Scott.*

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Prospectus from the Laboratory Secretary, School of Tropical Medicine, Pembroke Place, Liverpool, 3.

TREATMENT OF PATIENTS

There is an out-patient department at the School for all sufferers from diseases contracted in the tropics. Cases needing hospital treatment are admitted to the Tropical Ward (general and private wards) of the Liverpool Royal Infirmary, which adjoins the School. Special arrangements are made for Civil Servants, and for members of certain firms who are regular subscribers to the School.